

BULLETIN No. 34

COPYRIGHT 1934

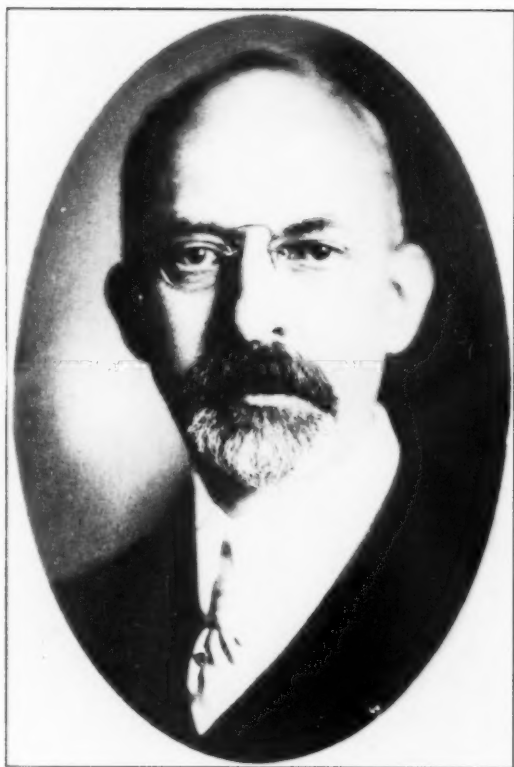
ISSUED BY

THE RAILWAY AND LOCOMOTIVE HISTORICAL SOCIETY, INC.
BAKER LIBRARY, HARVARD BUSINESS SCHOOL
BOSTON, MASSACHUSETTS

MAY, 1934

Price for Members \$1.00

Price for Non-members \$2.00



HENRY MUHLENBERG SPERRY
1861-1933

Table of Contents

The Penneyer Colored Prints.....	6
Bulletin No. 33.....	6
Meeting in Boston.....	7
Cover Design.....	7
Henry M. Sperry.....	8
New York Chapter.....	17
Boston Public Library Exhibition.....	18
The Dutchess & Columbia Railroad and its Associates.....	19
The Baldwin Magazine.....	27
The Standardization of the Track Gauge of American Railways.....	28
The Battle of Gauges in Canada.....	36
A Trip Over the Two Old Overland Trails From California Into Nevada	40
Locomotives of the Boston & Maine Railroad.....	52
Brief Sojourns	64
100th Anniversary of the Opening of the First Steam Railroad in Massachusetts	67
Worth Reading.....	69
New Books.....	71

***Officers and Directors of the Railway and Locomotive
Historical Society, Inc.***

CHAS. E. FISHER, *President*
6 Orkney Road, Brookline, Mass.

EDWARD HUNGERFORD, *Vice President*
230 Park Ave., New York, N. Y.

WARREN JACOBS, *Secretary*
South Station, Boston, Mass.

GEO. P. BECKER, *Treasurer*
96 Avon Hill St., Cambridge, Mass.

J. W. MERRILL, *Curator*
40 Broad St., Boston, Mass.

W. O. MOODY, *Director*
47 North Spring Ave., La Grange, Ill.

W. R. FOGG, *Director*
26 Monadnock St., Boston, Mass.

SIDNEY WITHINGTON, *Director*
7 Briar Lane, New Haven, Ct.

ARTHUR B. NICHOLS, *Director*
Vice President, Boston & Maine R. R., Boston, Mass

G. W. BISHOP, *Resident European Director*
12 Queen's Road, Kenilworth, Warwickshire, England

D. L. JOSLYN, *Resident Western Director*
2164 Castro Way, Sacramento, Calif.

PROF. EDWARD C. SCHMIDT, *Mid-Western Representative*
905 West California Ave., Urbana, Illinois

E. W. YOUNG, *Pacific Coast Representative*
2727 Pierce St., San Francisco, Cal.

ROBERT R. BROWN, *Eastern Canadian Representative*
700 St. Catherine St., West, Montreal, P. Q., Canada

NORMAN THOMPSON, *Western Canadian Representative*
Box No. 2004, Winnipeg, Manitoba, Canada

D. S. BARRIE, *British Representative*
24 Goldhurst Terrace, Hempstead, London, N. W. 6, England

THOMAS T. TABER, *Traveling Representative*
43 Hillcrest Road, Madison, N. J.

CARLTON PARKER, *Exchange Manager*
45 Warren St., Newton Center, Mass.

The Railway and Locomotive Historical Society, INC.

COMMITTEE IN CHARGE OF PUBLICATIONS

CHAS. E. FISHER, <i>Editor</i>	O. KUHLER, <i>Art Editor</i>
W. J. COUGHTRY, <i>Chairman, New York Committee</i>	
W. A. LUCAS	R. C. SCHMID
PROF. E. C. SCHMIDT, <i>Chairman, Mid-West Committee</i>	
W. O. MOODY	
D. L. JOSLYN, <i>Chairman, Western Committee</i>	
G. H. KNEISS	S. F. MERRITT
ROBERT R. BROWN, <i>Chairman, Canadian Committee</i>	S. H. TRUITT
W. T. COMLEY	J. H. EDGAR
W. M. SPRIGGS	JOHN LOYE
NORMAN THOMPSON	
G. W. BISHOP, <i>Chairman, Foreign Committee</i>	
F. ACHARD	E. METZELTIN
	E. ANDRE SCHEFER
	J. W. SMITH

In this BULLETIN we pay tribute to the memory of Henry Muhlenberg Sperry, Publicity Representative of the Union Switch & Signal Co. and the General Railway Signal Co. Mr. Sperry was a Life Member of this Society and was keenly interested in the purpose of this organization. Shortly before his death he promised your Editor a paper on the history of railroad signaling, a promise he would have kept had not death interfered. His paper read before the Pittsburgh Railway Club in 1926 is so interesting and so valuable from an historical standpoint that it has been decided to reproduce it in our Journal. It may interest our members to learn that the late Henry Muhlenberg Sperry was a direct descendant of Henry Melchior Muhlenberg, founder of the Lutheran Church in America and his son, Frederick Augustus Conrad Muhlenberg, member of the Continental Congress and first speaker of the House of Representatives.

Last summer two of our members on the Pacific Coast visited the Virginia & Truckee R. R. of Nevada. This little road, equipped after the fashion of the seventies is still in service and must make an interesting sight to behold. The story of their visit to the road and to other points of interest, together with the fine set of photographs, tells a story of days long ago and almost forgotten.

In his contribution on the different gauges of tracks Mr. Westbay has given us some material about which considerable is known in a general way but less in specific instances. One of the most interesting little railroads in New England, until its recent electrification and just across Boston Harbor, was the Boston, Revere Beach & Lynn R. R., com-

monly called the "Yard wide line!" The sight of those little bogie engines, built to Mason's pattern, with the Walschaert valve gear swinging back and forth, running across the Lynn marshes, was a sight never to be forgotten.

In dealing with the history of the Dutchess & Columbia R. R. we are indebted to Mr. Stuart for preserving in our records a much valued history of a small railroad and the men who built and managed it. In the present day of severe competition, these roads if not already merged with larger systems soon will be or will disappear almost in entirety. Thus has been preserved for our members the story of the Dutchess & Columbia R. R.

We welcome the list of books suggested by our member, Miss Elizabeth O. Cullen, Reference Librarian of the Bureau of Railway Economics. These books are not only worth reading but are worth owning and we appreciate the kindness of Miss Cullen in sending in this material to our members.

Lastly, the check list of Boston & Maine R. R. locomotives is rapidly drawing to a close. With the publication of the Concord & Montreal and the Fitchburg locomotives, the series will end in 1935. Originally published out of respect to Mr. Yeaton for his efforts in arranging this list, we may frankly ask our members if the publication of this check list has been of any interest and value to them and is there a demand for further check lists of this nature? Won't you express an opinion!

The Pennoyer Colored Prints

Those of our members who were able to visit the exhibition sponsored by this Society on the East Balcony of the Grand Central Terminal, New York City, were afforded the opportunity of seeing two of the original paintings of this set. The reproductions which this Society can furnish our members are fully as interesting. The set includes "Snowbound", a Crampton type of locomotive of 1850 on the Camden & Amboy R. R.; the "Pioneer", built by Seth Wilmarth, of Boston, for the Cumberland Valley R. R., in 1851; An American Express train of the seventies drawn by a Rogers locomotive and, through the kindness of the Delaware & Hudson R. R., we are able to include the "Stourbridge Lion", imported by that road from England, in 1829. The size of the "Pioneer" is 7x11, the other three are 8¼x10½. There are still a few sets remaining. The price is \$5.00 per set. Orders should be sent to CHAS. E. FISHER, 6 Orkney Road, Brookline, Mass.

Bulletin No. 33

"Lincoln on the New Haven and Boston & Albany Railroads", the subject of this bulletin, has met with a very wide appeal. The author, Warren Jacobs, the Secretary of this Society, has painstakingly

followed Abraham Lincoln in his two trips to New England in 1848 and 1860, over the roads now making up the two above mentioned roads. Never before has this material been arranged as completely as this and placed between two covers. To those of our members who are interested in this subject or whose file of bulletins is incomplete without this copy, we suggest that you procure your copy before the few remaining numbers are exhausted.

In connection with Bulletin No. 32, we regret to announce an error in the date of Mr. Joslyn's article on page 67. The date 1886, should read 1866.

Meeting in Boston

Mr. John W. Merrill, our Curator, with a view of wishing our members to inspect some of the additional material in the Baker Library, has invited our members to a get-together meeting on Sunday afternoon, May 27—any time after 3:00 P. M. Those of our members who care to come, will be more than welcome. In this connection it has been the thought of some of our officers that perhaps the interests of our members might be served better here in Boston, by having meetings at stated periods during the year, save in the summer, or six meetings between October and May. We would appreciate the opinion of our members in this matter—as to the frequency of these meetings, the day of the week and the time of the day and what subject or subjects would meet with your approval. Won't you communicate your wishes in this respect to our Secretary, Warren Jacobs. Our Room Committee is willing to assist in every way possible in this matter. A change in working conditions for the time being has prevented Mr. Fogg from continuing his services in the Baker Library, tho' he is still retained on the Committee. Mr. Monypeny and Mr. A. Sheldon Pennoyer in an advisory capacity, have been added to our Room Committee.

Cover Design

Again our fellow member and artist, Mr. Kuhler has favored us with one of his sketches for our cover. Here we have the "W. A. Tower" on the Concord R. R. rushing through one of our quiet New England villages. One can almost hear the click of the rails, the sound of the exhaust and smell the wood smoke as the "W. A. Tower" tears through this little New England village, somewhere up in the Merrimac Valley! Again we wish to express our appreciation to Mr. Kuhler for his kindness in furnishing us with such a clever and interesting cover design.

Henry M. Sperry

By CHAS. E. FISHER

HENRY MUHLENBURG SPERRY, Publicity Representative of the Union Switch & Signal Co. and the General Railway Signal Co., Life Member of this Society, whose death was recorded in our Bulletin No. 32, was born on August 4, 1861 at Baltimore, Maryland and educated at the Protestant Episcopal Academy in Philadelphia, Pennsylvania.

At the age of twenty, Mr. Sperry entered the service of the Pennsylvania R. R. as a member of the engineering corps on the New York Division. In 1887 he was appointed supervisor of signals of this division and it was under his administration that the New York Division was changed from a double track to a four track road. This required the construction of a large number of interlocking plants.

In December, 1891, he resigned his position with the Pennsylvania R. R. and became the General Agent for the Johnson Railroad Signal Co. In this connection he had charge of the construction of the new block signals on the New York Central R. R.

In June, 1894, he was appointed Signal Engineer and Agent for the Western District of the National Switch & Signal Co. Here he designed and built the large interlocking plant at State Line, Ind. and installed the signals on the Chicago Elevated Railroads.

In January, 1899, he was appointed to the same position with the Union Switch & Signal Co. at New York. In this connection he drew the plans on the reconstruction of the St. Paul Union Depot; the preliminary plans and method of signaling for the subways operated by the Interborough Rapid Transit Co. as well as prepared the plans and had charge of the construction and signaling on the New York & Long Branch R. R.

In February, 1905, he became Consulting Signal Engineer for the Hudson Companies of New York, preparing the plans and reports for the four tunnels under the Hudson River and the terminal at Church Street.

The General Railway Signal Co. appointed him Resident Manager in New York, in 1906 and in 1914 he became manager of the Department of Publicity and Education. On January 1, 1917, he also took up the duties of Publicity Representative of the Union Switch & Signal Co.

Mr. Sperry was an authority on signaling. Shortly before his death he had promised to write a contribution for this Society, covering briefly the history of signaling. That paper now, can never be published. Through the kindness of the Railway Club of Pittsburgh, we are reproducing a portion of a paper read before that club on March 25, 1926.

Mr. Sperry's opening remarks first stressed the need of transportation in this country. He continued with

"This paper is to deal primarily with the relation between modern signaling and train service efficiency under present day conditions. Inasmuch, however, as present practice is the result of nearly a century of evolution, some attention will be given to the outstanding historical facts connected with the development of train move-

ment direction. These methods from the beginning of steam transportation have been based upon one or the other or both of two definite principles—first the time interval and second space interval. In the earlier days general practice favored the time interval but under modern conditions the space interval under signal indication is universally recognized as the method which insures the maximum of train protection with the minimum of train delay, risk and expense.

"With the time interval method train movements are directed by time tables, train orders, and train dispatching. Prior to the electric telegraph the time table was the sole authority for train movements and serious delays were often unavoidable. The Morse electric telegraph came into use in 1844 and seven years later it was first used in train operation for the sending of train orders.

"With the first train order came telegraphic train dispatching which offered an effective means for reducing the delays incident to operation under time tables. Time tables make no provision for the prompt movement of delayed trains or for the running of extra trains. The following description of the first train order, from Mott's History of the Erie Railroad, shows how train dispatching came into use.

"To Charles Minot belongs the honor of having made the first practical application of the Morse telegraph to railroading, either in this or in any other country, when, in the early Autumn of 1851 he successfully ran a train by telegraph order, for a distance of 14 miles on the Erie Railroad.

"From this humble beginning there has been developed a system (train dispatching) that was universally adopted by railroads, not only in the United States, but throughout the world. * * *

"Up to the time of Minot's initial experiment with telegraphic train orders, railroad trains were run on what was called the 'time interval system.' The practice was that a ruling train had right of one hour against the opposing train of the same class.

"W. H. Stewart was running the westbound express train on the day when General Superintendent Minot happened to be going over the road on that train which, under the rule then existing, must wait for an eastbound express to pass it at Turner, 47 miles from New York. That train had not arrived, and the westbound train could not proceed until an hour had expired, unless the tardy eastbound train arrived in the meantime. There was a telegraph office at Turner and General Superintendent Minot telegraphed the operator at Goshen, 14 miles further on, and asked him whether the eastbound train had left the station. The reply was that the train had not yet arrived. Superintendent Minot then telegraphed as follows:

'To Agent and Operator at Goshen:

HOLD THE TRAIN FOR FURTHER ORDERS.

Chas. Minot, Superintendent.'

He then wrote this order and handed it to Conductor Stewart:

'To Conductor and Engineer Day Express:

RUN TO GOSHEN REGARDLESS OF OPPOSING TRAIN.

Chas. Minot, Superintendent.'

"I took the order,' said Mr. Stewart, 'showed it to the engineer, Isaac Lewis, and told him to go ahead. The surprised engineer read the order, and, handing it back to me, exclaimed:

"Do you take me for a d—d fool? I won't run by that thing!"

"I reported to Superintendent Minot, who went forward and used his verbal authority on the engineer, but without effect. Minot then climbed into the engine and took charge of it himself. Engineer Lewis jumped off and got in the rear seat of the last car. The Superintendent ran the train to Goshen. The eastbound train had not yet arrived. He telegraphed to Middletown. The train had not arrived there. The westbound train was run on a similar

order to Middletown, and from there to Port Jervis, where it entered the yard from the east just as the other train came into it from the west.

"An hour and more in time had been saved to the westbound train, and the question of running trains on the Erie by telegraph was at once and forever settled."

"Superintendent Minot was our first train dispatcher. Today there is a force of 5,400 train dispatchers and in addition, 59,600 other employees wholly or partially employed in supervising and directing the movement of trains. The total wages in 1925 were \$122,000,000.

"Two forms of train orders are in use, form 31 and form 19. The rules require that form 31 shall be receipted for in writing by the conductor of the train addressed. Form 19 is receipted for by the station operator, who is held responsible for the delivery of the order to the conductor and engineman of the train addressed.

"Because of this difference in delivery, a moving train is required to stop for a '31' order, but need only slacken speed for a '19' order. If the order should authorize the train to continue its journey, then the delivery of the '31' order, requiring the train to stop, causes a useless delay that might have been avoided by the use of the '19' order.

"Today there is an increasing tendency toward a greater use of the '19' order to eliminate train stops and thus save time and coal. Keeping trains moving increases the output of train miles per train hour.

"When Superintendent Minot, in his effort to keep trains moving, issued his first train order he probably did not dream of the magnitude of the effort that must be made today. It is estimated that no less than 130,000 train orders are issued daily, or a total of 47,000,000 orders a year. As practically all train orders are issued in duplicate, the total number delivered to trains is nearly 95,000,000 orders. This is a conservative figure as sometimes even three or more copies of an order are made.

"With the space interval method, train movements are directed, as in the time interval method, by time tables, train orders, and train dispatching, and in addition by block signals.

"Block signals are for the purpose of reducing the hazards of train operation by maintaining a space interval between trains. Space between trains spells safety from collision.

"In the time interval method, the effort to maintain a space interval by requiring trains to run at least five or ten minutes apart, too often fails of its purpose. It is practically impossible always to maintain under any *time* interval method a *space* interval between trains running at different speeds. For example, trains may be scheduled to move on ten minute intervals, but unless these trains are kept moving at the *same speed*, the ten minute margin may be reduced to zero. Should the margin be reduced by one of the trains stopping, entire dependence for protection against accident is placed upon the vigilance of the engineman of an approaching train and upon the alertness of the flagman of the stopping train.

"From this it will be seen that the time interval method affords no protection to a train that has stopped at other than a designated stopping point. The stopping train must at once provide its own protection by sending out a flag to stop a following train, and on single track a flag to stop a train approaching from the opposite direction. In other words, the stopping train must, for its own protection, set up temporary signals for the purpose of providing space in which approaching trains can be stopped.

"In the space interval, or block signal system, space is maintained between trains by dividing the road into sections with fixed signals to govern the movement from section to section.

"The following story of the first use of block signals will show the value of maintaining the space interval between trains was recognized over ninety years ago (From a paper on 'Signals', by J. Elfreth Watkins of the Pennsylvania Railroad, 1899.)

"Although the block system of signals is generally believed to be of English origin, it is a matter of record that it was in use on an American railroad, now forming a part of the Pennsylvania Railroad System in 1832.

"Soon after the New Castle and Frenchtown Railroad was opened for traffic (it having been operated for two or three years by horse power) the necessity for establishing a system of signals became apparent. This pioneer road was located across the peninsula of the southern part of Maryland and the State of Delaware and extended from New Castle, on the Delaware river, 17 miles to Frenchtown, on the Elk river, a tributary of Chesapeake Bay. Poles, thirty or thirty-five feet high, were located about three miles apart, and when the train started from either end the flagman at the terminal station hoisted a white flag to the top of the pole. The flagman at the second station, whose duty it was to look through a nautical telescope every few minutes during the day, hoisted his flag to a point a few feet from the top of the pole. The remaining flagmen followed his example so that at New Castle it was known that the train had started from Frenchtown within a few minutes after it had left that station and each flagman was able to note its passage through each 'block'. After a time it was customary to hoist the flag on the Court House steeple at New Castle when the train departed from that point, the intelligence being communicated from block to block as above described, until the flagman at Frenchtown was in receipt of the information. When for any reason the locomotive became disabled, or the train was delayed by other circumstances, a black flag instead of a white flag was hoisted. This method of block signaling proved so satisfactory that flags after a time were dispensed with, and bell-shaped signals, consisting of peach baskets covered with colored cloth were used."

"This crude block system, put in use twelve years before the advent of the electric telegraph in America, had many of the features of present day block signaling. The division of the road into block sections with fixed signals governing the entrance to each section corresponds with present day practice."

"The fixed signals, as described, gave three indications, the ball at full mast, half mast, and the black ball. Today fixed signal indications are given by semaphores and by light signals. It seems significant that a black ball was used to indicate a disabled train. This indication has no counterpart in modern signaling."

"The telescope of the man operating the signals has been replaced by the telegraph and the telephone for communicating from station to station. The control of the signals has been replaced, in the automatic block system, by the track circuit by which the train itself automatically controls the signals that govern the section the train occupies."

"The first complete block signal system in the United States was established in the year 1863 on the railway between Philadelphia and Trenton, now a part of the Pennsylvania Railroad. This signal system was put into use to provide for a heavy movement of trains carrying troops during the Civil War."

"The principal advantages of the block signal system are:

A. It provides a space interval between trains. It is self-evident that this is essential to safe operation.

B. It provides an effective check against the many possibilities for error in directing train movements by written or printed instructions."

Mr. Sperry next mentioned three wrecks due to the misunderstanding of written orders. The first one read—"No. 165 wait at Bartonsville until 4:50 P. M. for Extra 28 South." This order was mis-read by all five of the crew on Extra 28 to meet No. 165 at Bellows Falls. The freight train passed Bartonsville without stopping and about seven miles further on collided with the passenger train at full speed in which ten persons were killed and thirty-two were injured.

The second instance recited by Mr. Sperry was a head-on collision resulting from the following order—"First No. 82 meet No. 89 on double track at U" The engineman of train No. 89 stated he read the order to the conductor and also that the wind was blowing considerably

at the time. In holding the order, his thumb covered the word "first" in the message. Because of this misunderstanding, train No. 89 left S. . . . after first No. 82 had passed, meeting second No. 82 about three miles beyond. One person was killed and thirty-one were injured.

The third collision mentioned by Mr. Sperry was the result of an overlooked order causing a head-on collision between two passenger trains. Here three orders were issued together with a clearance card stating that there were three orders, and were delivered in duplicate to the conductor who turned one set over to the engineman. The engineman, who was oiling the engine as his custom at C . . . , where the orders were received, asked the conductor to put the orders in his overalls pocket. Receiving the signal to proceed, he was so engrossed in leaving behind the first section he neglected to show the orders to the fireman. Further, when he read the clearance card, he did not have on his glasses, and although the figure on the clearance card showed a plain "3", he misread it for a "2" and did not check the orders as the rules require. The conductor tried to stop the train after passing the meeting point, but it was too late. One person was killed and fifty-six were injured in the collision which resulted. The above collisions were all on railroads on which the block system of signals was not in use at the time and they illustrate the danger in directing train movements by messages bearing printed or written instructions which may be misread, overlooked or forgotten. Mr. Sperry continues:

"The space interval method on the other hand, through the use of block signals, provides an effective check against this class of error. In the three cases cited the engineman would have had his error brought to his attention, not by a collision with an opposing train, but by the indication of a signal giving him ample warning of danger ahead.

"In the time interval method, as previously stated, the movement of trains not provided for in the time table is directed by train orders. In the space interval method, although train orders are also used extensively, the standard code rules provide that block signals may be used in place of train orders.

"The rules for this method of operation were first adopted by the American Railway Association in 1903 and 1904. These rules provide for the movement of trains with or against the current of traffic on two or more tracks by block signals whose indications supersede time table superiority and take the place of train orders. The rules adopted 1915 provide further for the movement of trains on single track by controlled manual block signals whose indications supersede time table superiority and take the place of train orders.

"The movement of trains by block signals on two or more tracks *with* the current of traffic is in very general use. Train movement *against* the current of traffic, that is, in either direction on one or more tracks of a multiple track road, is in use on a number of heavy traffic roads. The method of directing the movement of trains by signal indication without train orders eliminates the unavoidable delays of the written train orders, and makes possible the operation of trains at maximum track capacity.

"The economic advantages of the space interval method, particularly for operation *with* the current of traffic, are fully appreciated, and increasing consideration is now being given to making a more intensive use of track facilities by train operation by signal indication in either direction on one or more tracks of multiple track roads.

"Either direction operation came into use as a means to increase the track capacity of double track roads, by adding a third track and operating the middle of the three in either direction.

"The following is a brief summary of what has been done:

"The Chicago, Burlington & Quincy was one of the first railroads to operate three tracks in this way. A fourteen mile section of the main line near Chicago was put into use under this method in 1888.

"At present the main line from Chicago west to Galesburg, Illinois, consists of 119 miles of double track and 44 miles of three tracks, or a total of 163 road miles. Both tracks of the double track and the middle track of the three tracks are signaled for operation in *either* direction. This intensive use of existing track facilities not only provides for the movement of a heavy traffic in and out of Chicago, but has also deferred the construction of additional main tracks.

"The Baltimore & Ohio, in 1911, put in use on its Cumberland Division a 36 miles section of three tracks with the middle track operated in either direction by signal indication. The operation during the past 15 years has proven so satisfactory that the construction of a fourth track has not yet been found necessary.

"The Pennsylvania Railroad had a difficult situation on the section of the Middle division between Spruce Creek and Tyrone Forge, Pa., where the road follows the Juniata river and in a distance of seven miles crosses the river seventeen times. Due to the heavy cost of construction the four-track system of the division is limited to three tracks through this section. To provide for an increasing traffic the middle track, in 1913, was signaled for operation in either direction.

"Through this method of track capacity the construction of a fourth track has not yet been found necessary. The saving in interest charges alone on the additional cost of a main track has been at the rate of \$45,000 a year, or for the thirteen years, \$585,000. This amount is enough to pay for half the construction cost of a fourth track. These figures emphasize the value of an intensive use of track facilities through train operation by signal indication.

"The Illinois Central, in 1925, put in use near Chicago a 25 mile section of three tracks with the middle track operated in either direction by signal indication. The operating results have been highly satisfactory.

"The Delaware, Lackawanna & Western moves a heavy suburban traffic over its lines between Hoboken and Millburn, N. J. Between West End Junction (two miles from Hoboken) and Millburn, there are three tracks for 15 miles. In 1922 either direction operation was put into use on the middle track for the 15 miles and on the north track for 4 miles. This arrangement provides a track capacity nearly equal to that of four tracks, as in the morning rush hours two tracks for 11 miles and three tracks for 4 miles are used for trains to New York. In the evening rush hours two tracks are used for the entire distance for trains from New York.

"The traffic through the Hoboken Terminal is 70,000 passengers each week day, requiring a movement of 228 trains, or a train every 6 1/3 minutes throughout the entire 24 hours.

"As the line passes through the city of Newark, the cost of constructing a fourth track is almost prohibitive.

"The Chesapeake & Ohio at West Ashland, Ky., put into operation in 1925 a three-track section, 3.3 miles in length. This is the last word in three track operation, as all three of the tracks are operated in either direction by signal indication.

"Next in order is the operation in either direction of *both* tracks of double track roads by signal indication. The most notable example is the double track section of 119 miles on the Chicago, Burlington & Quincy, previously described. Both tracks are provided with automatic block signals for operation in either direction. Fast trains may easily run around slow moving trains.

"Other notable installations are as follows:

"Chesapeake & Ohio, six double track sections with a total of 40 miles.

"Illinois Central, 20 mile section adjacent to its three track section.

"Pennsylvania Railroad, on the line between New York City and Manhattan Junction, eight miles, also double track section on the Tyrone Division of five miles.

"Either direction operation on double tracks by train orders is not included in this record.

"In certain situations on four-track roads, traffic has taxed the capacity of the four tracks to a point where it has been necessary to operate one or all of the four tracks in either direction.

"On the Pennsylvania Railroad, Pittsburgh Division, between South Fork and Sheridan, passing through Conemaugh and Johnstown, westward track No. 3 of the

four tracks is operated for a distance of 11 miles in either direction by signal indication. This arrangement provides for the operation of three eastward and two westward main tracks. There is a normal daily movement through this section of 220 trains, 88 passenger and 132 freight.

"The freight trains all stop at Conemaugh to take on helper engines and to clean fires before starting up the 24 mile grade over the Allegheny mountains. This, at times, congests both the eastward tracks. No. 3 track is then brought into use for eastward trains. There is a daily movement over this track of 11 eastward passenger trains.

"These movements are made with little or no delay as they are governed entirely by signal indication without the use of train orders.

"The New York Central and the New York, New Haven & Hartford enter New York over a four-track line extending from Mott Haven Junction to Grand Central Terminal, a distance of five miles. The Grand Central Terminal is a two level passenger station with 32 miles of track. The travel through this station requires the movement of 430 trains a day. During the rush hours the traffic reaches a total movement of 52 trains in one hour, or a train every 71 seconds. This heavy traffic made it necessary to increase the track capacity of the four-track approach. Additional main tracks would have required the enlargement of the tunnel, and the elevated structure through Park Avenue, and of the four-track drawbridge over the Harlem river. The alternative of making a greater use of the existing tracks was decided upon, and the westerly track of the four was put into use, in 1924, for either direction indication by signal indication. This provided for an additional main track for outgoing movements, making three tracks available for this purpose in place of two.

"The cost of the signaling was \$90,000, a sum far less than the annual interest charges on the construction of an additional track.

"The New York, New Haven & Hartford at New Haven has a situation similar to that of the New York Central. The main lines from the north and northeast enter the station at New Haven through a "cut" only wide enough for four tracks, and, as the "cut" passes through the business section of the city, heavy expenditures would be required to provide additional tracks. The traffic over the four tracks is 296 trains a day. The two center tracks are now operated in either direction for a distance of one mile by signal indication.

"The Erie Railroad holds the record for either direction operation on four tracks. At Jersey City the four-track approach to the station for a distance of two miles has all four tracks arranged for either direction operation by signal indication.

"Train operation on single track by signal indication is not new as that method was put into successful use in 1882 on the Pennsylvania Railroad at Louisville, Ky. Proof of the value of that method of operation is found in the fact that the installation after 44 years of satisfactory service is still in use.

"That installation was an early recognition of the many advantages of the space interval method (the block system) over the time interval method. In 1882 the line crossing the Louisville bridge over the Ohio river was single track, and on the Indiana side the line diverged east and west. The trains in and out of Louisville over the bridge totaled 150 a day. To direct their movements by time tables and train orders was difficult, if not impossible, because Standard Time had not come into use. Trains were scheduled on the local time of the four roads and each one had a different time standard. The time difference made it practically impossible to operate trains by time tables and train orders. These, of course, required a single standard of time.

"The difficulties in the situation brought the space interval method into use. Six manual block sections were established on the $5\frac{1}{2}$ miles of single track and $2\frac{1}{2}$ miles of double track covering the bridge and the tracks approaching it. A special dispatcher at the bridge station controlled the territory by directing the movement of trains through the operators at the other six block stations.

"The dispatcher, in addition to making the usual train sheet record of the trains, uses a mnemonic board as an aid in visualizing their movements. This board is ruled off into columns with a column assigned to each train. The columns sub-divided represent the different block sections. The trains are represented by small pegs which are moved from section to section by the dispatcher at the time

he issues instructions to the block operators. This board is in effect a handoperated train diagram.

"At Louisville through the territory controlled by the signals there is, at present, a daily movement of 325 to 350 trains.

"The successful operation of the system for nearly half a century has no doubt been due to the fact that trains are operated by block signals. Time tables and train orders were thrown into the discard as trains are operated entirely by signal indication.

"Another early installation of train operation by signal indication was made in 1889 on the Nashville, Chattanooga & St. Louis Railway in the vicinity of Chattanooga, Tenn. The system covered 4.4 miles of single track and 1.6 miles of double track, divided into three manual block sections all under the control of the dispatcher at Chattanooga.

"The system remained in use until 1912 when the line was double tracked. The total movement in the 24 years over the single track section was 518,000 trains. In addition to making a 100 per cent safety record, the system should have credit for having postponed the construction of a double track, thus saving the interest on the cost and the maintenance charges on the up-keep of a second track for 24 years.

"The third installation was made in 1907 on the Pennsylvania Railroad in the vicinity of Huntley, Pa. This installation covered 8.6 miles of single track divided into two block sections. In this installation the controlled manual block system was used, the signals being controlled by track circuits and by the operators. This installation is still in use with an average daily traffic of 42 trains.

"The fourth installation, made in 1909 on the Central New England Railway between Highland and Maybrook, N. Y., was notable as it relieved a traffic congestion which at times taxed the train dispatchers to the utmost. The installation covered 13.2 miles of single track and 7 miles of double track, divided into nine controlled manual block sections. Trains were moved by signal indications without train orders under a very simple rule:

'Electric signals will govern train movements on single track within these limits regardless of time table rights.'

"The daily traffic averaged 41 to 46 trains. Traffic capacity was increased 25 per cent and double tracking was postponed for five years. The original signals were used in the double track signaling.

"The total net saving for the five year period in interest charges and maintenance, by deferring the double tracking, exclusive of any saving in operating expenses, amounted to \$315,000, equal to 44 per cent of the total cost of the double tracking. The signals not only paid their own way, but helped to pay for the double tracking.

"The fifth installation, in 1911, and the second on the Nashville, Chattanooga & St. Louis Railway, was between Cowan and Sherwood, Tenn. The installation covered 11 miles of single track divided into four controlled manual block sections with an average daily movement of 34 trains. In 1911, the traffic having reached a daily average of 56 trains, 2½ miles of the line were double tracked.

"That section is the limiting point of the division and is a difficult one to operate on account of the heavy curvature and the 2 per cent grade, requiring pusher service, over the Cumberland mountains. As no less than 50 train orders per day were eliminated by operation by signals, the delays incidental to operation by train orders were reduced.

"The sixth installation, made in 1919 on the Chesapeake & Ohio Railway, between Cotton Hill and Gauley, West Virginia, covers four miles of single track divided into three controlled manual block sections. A distinctive feature of the installation is the use of a hand-driven A. C. generator of 125 cycles for operating the traffic locks controlling the signals. The daily traffic averages 38 trains.

"The seventh installation was made in 1925 on the Missouri Pacific Railroad in the vicinity of Kansas City, Mo. and covered 56 miles of single track with 14 passing sidings. Twelve of the siding switches are operated from the nearest stations, thus permitting trains to enter and leave sidings without stopping to throw the switches. Train movements are directed entirely by signal indication under a controlled manual block system with automatic train control. The daily traffic is

32 to 40 trains. Double tracking estimated to cost at least \$2,000,000 has been postponed.

"The results, as stated by the railroad, based on comparison of the months of October, November and December, 1924, and January, 1925, with the same months of 1925 and 1926, are as follows:

"Average speed of freight trains increased from 10.45 miles per hour to 12.14 miles per hour, or an increase of 16 per cent.

"The gross ton miles per train hour increased from 20,152 to 23,513, or an increase of 17 per cent.

"Coal consumption per month decreased from 209 lbs. to 192 lbs., per thousand gross ton miles, or a decrease of 8 per cent.

"In addition to these improvements in operation, the saving in interest charges on the cost of the construction of the second main track will amount to no less than \$100,000 per annum.

"This last installation completes my record, which includes not only the installations of train operation by signal indication for 'either direction' movements on one or more tracks of multiple track roads, but also includes the installations on single track roads. Even if the record should not include all of the installations that have been made, it is believed to be sufficient to prove the value of operating trains by signal indication.

"No claim is made that the results accomplished were entirely due to the signaling, as many factors usually enter into any improvement in train operation. This is particularly so on single track where coincident with signaling provision is made for better siding facilities and the operation of siding switches.

"The purpose of this paper has been to point out the inherent defects in any time interval method and to emphasize the value of the space interval method, and also to direct attention to the marked advantages of substituting signal indication for the train order in directing the movement of trains.

"Efficient transportation is largely dependent upon an efficient direction of train movements and much depends upon the kind of instructions used in directing train movements.

"Train orders are written instructions and must be delivered to the conductor or engineman of the train. They must be correctly prepared, carefully transmitted, and faithfully delivered. Above all, they must be uniformly understood by all concerned, and must not be forgotten. On railroads *not* equipped with block signals, safety of operation depends entirely upon the human element. There is no check by a block signal against an improper train movement should an error or failure occur in the preparation or delivery of the order, or should the order be misunderstood or forgotten.

"Signal indications are instructions given by the aspects of fixed wayside signals. Instructions given by signal indications require less effort in preparation and transmittal than do written instructions. They are delivered to the engineman from block to block through the medium of the signal. The language of the signal is easy to understand and difficult to forget. The signal aspects are few in number and may be regarded as instructions reduced to a minimum in standard form, and hence, there is little opportunity for misunderstanding. The instructions conveyed by the signals are given at the point where they are to be executed and there is no lapse of time in which to forget them.

"In conclusion, the case of signal indication versus the train order as the method of directing train movements, may be briefly summarized in three points:

1. The science of signaling has now developed far beyond the stage of experiment. Abundant experience has proved that by directing train movements by fixed wayside signals is both practical and efficient.

2. The construction, maintenance and operation of a signal system for directing train movements by signal indication can all be carried out by methods that have stood the test of time.

3. Experience in every case has shown substantial economic advantages, an increase in safety, a reduction in train delays, an increase in ton miles per train hour, and a decrease in total ton mile cost."

Our readers must realize that since this paper was read, in 1926, additional miles of railroad, controlled by signal indication, have been equipped in addition to those mentioned in Mr. Sperry's paper.

It may be of interest to our members to learn that the material appearing in the "Encyclopedia Britannica" under the caption—"Railway Signalling", was written by Mr. Sperry. Mr. Sperry worked as Consulting Engineer with the Special Committee of the Signal Section of the American Railway Association. There is no question but that he will be sadly missed and his paper is reproduced as a tribute to the memory of one of our members.

New York Chapter

On November 18th last, through the courtesy of the New York Central R. R., some thirty of our members living in or near New York City, met in the old Board Room at 466 Lexington Ave. for the purpose of discussing the formation of a New York Chapter of this Society. About thirty gentlemen were present and during the two hours session there was a definite trend in the discussion towards the formation of such a chapter. The question of a museum developed the greatest interest. Mr. Johnston, Librarian of the Bureau of Railway Economics suggested the association of this museum with some large literary collection.

Another meeting was held the month following but unfortunately the evening selected was the same night as the meeting of the New York Railroad Club and there was not as large a number of our members present. Again the formation of a chapter was discussed and its relationship with the parent Society.

At the Annual Meeting, held in the Baker Library, on January 14th last, at which meeting several of our members living in or near New York City were present, upon motion made by Mr. Hungerford that upon the presentation of a petition, the Directors of the Society should recognize the formation of this New York Chapter. Accordingly, upon receipt of this petition, our Secretary, Warren Jacobs, on the 23rd of February last, authorized the formation of the New York Chapter of this Society, for the following purposes:

1. To hold meetings, thereby bringing together the members for the exchange of ideas and material.
2. To bring the members together to provide leadership and to direct the activities of the Chapter.
3. To increase the membership of the Society, through the appointment of and by means of a Membership Committee.
4. To work for the preservation, collection and exhibition of historical railroad material.
5. To assist in gathering and preparing material for the publications of the Society.
6. To more closely knit the ties between this Chapter and the Headquarters of the Railway and Locomotive Historical Society.

The above petition was granted, subject to the By-Laws and such amendments of the Railway and Locomotive Historical Society.

On March 24th, the third meeting of the New York Chapter was held in Room 1101 of the United Engineering Societies' Building, 29 West 39th Street. After the acceptance of the above permission, election of Directors for the New York Chapter and a discussion, Mr. John Draney, Retired Engineman of the Delaware, Lackawanna & Western R. R., entertained our members with many of his thrilling experiences on the "head end" of some of the Lackawanna locomotives.

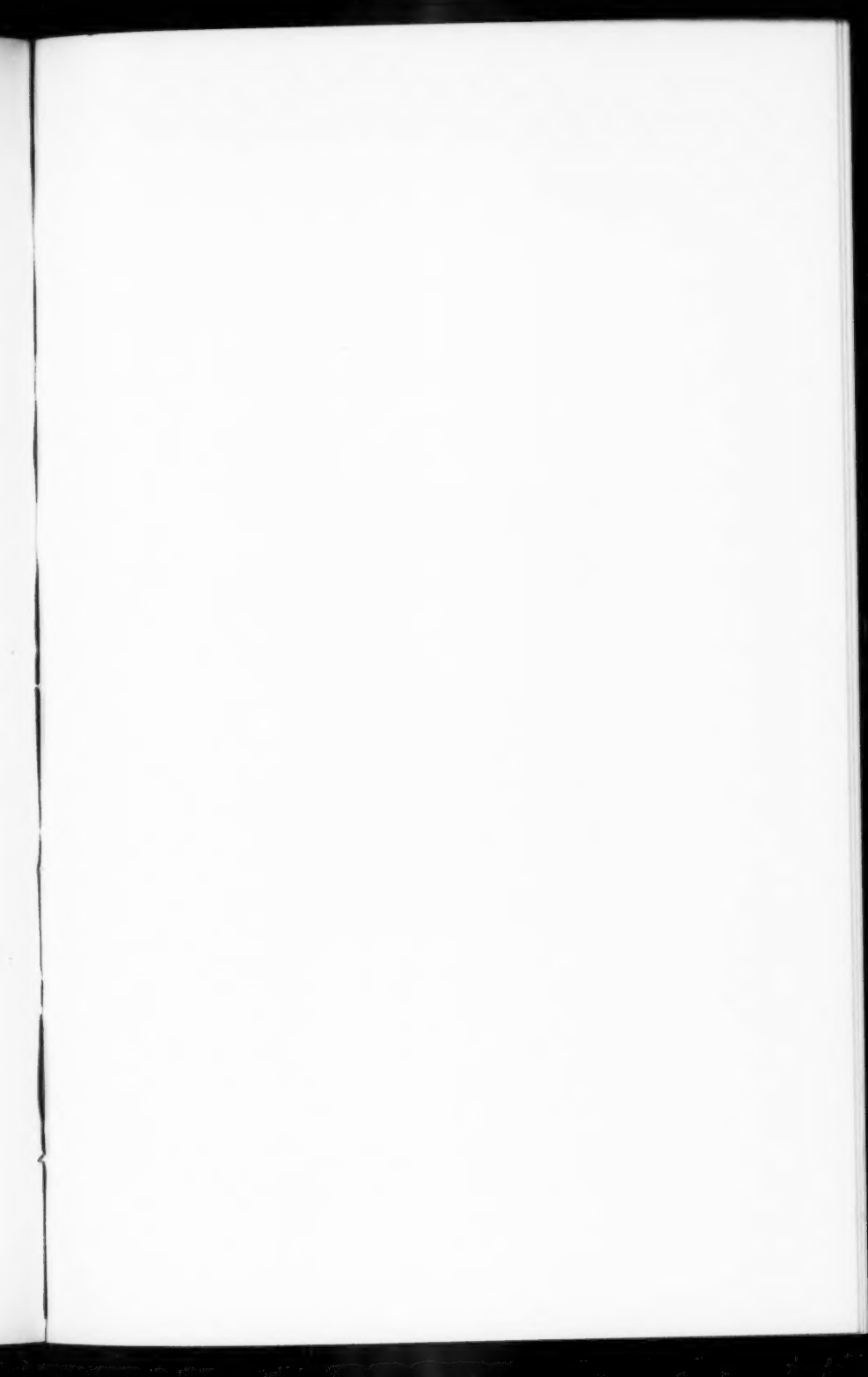
One incident is worthy of recording in our bulletin, our only regret is that we have not all of them. It seems that one day after completing his eastbound run he was a much wanted man in the Superintendent's office. The Roundhouse Foreman, the Master Mechanic and several others had asked him if he had reported to the Superintendent. In fact they were so anxious to have him report they would hardly allow him time to complete his duties at the end of his run. Engineman Draney set out for the Superintendent's office wondering what rule or set of rules he had transgressed and what he was to be called "on the carpet" for.

Now it seems that some time before, the "Buffalo Limited" which was the westbound train handled by John Draney, had sideswiped a freight train this side of Scranton. Fortunately no one was hurt, the cars remained upright on the track—only the engine was on her side and the tender derailed, the engine crew were unhurt. In those days the Lackawanna trains carried a portable telephone outfit which could be plugged into the telephone by means of a long pole. The wreck occurred at night and it meant considerable time fishing for the right wire. Kicking off his shoes, John Draney climbed a pole and was finally able to get the dispatcher at Scranton, Pa. This man lost all sense of the disaster and in addition to calling out the wrecking train, called out the doctors, nurses and ambulances. In disgust, John Draney got the Superintendent's office at Hoboken. Here he again stated the disaster, gave instructions as to how following trains might be diverted and that a spare engine at one of the lower stations might be sent to pull the cars back and divert the train to its destination over other rails. All this sounds simple to the reader or listener—but remember—John Draney was holding on to the pole while issuing these instructions and giving this information.

It was for this reason he was summoned to the Superintendent's office for there, the President of the Delaware, Lackawanna & Western R. R., together with the Directors of that railroad, presented him with a handsome watch charm, which he proudly displayed to our members. Well may John Draney be proud of this charm and for the faithful years of service he has spent in the employ of the Delaware, Lackawanna & Western Railroad! May your coming years be blessed with happiness.

Boston Public Library Exhibition

Contrary to the announcement made in our 1934 leaflet, issued on February 1st, the Boston Public Library has changed the dates of this exhibit from April 30th to May 20th incl. The exhibit will include railroad posters and travel literature, as originally outlined and will be in keeping with the previous exhibits arranged by this Society under the direction of our Secretary, Warren Jacobs.





Courtesy of Miss Barnes
Oliver Weldon Barnes, C. E.

The Dutchess & Columbia R. R. and Its Associates

By INGLIS STUART

CHARTERED in 1866, the route of the Dutchess & Columbia R. R. began where the southerly lines of Dutchess County touched the shore of the Hudson. A survey in early days had been chained and linked due east from the river. Its start was denominated—"Plumb Point"—as marked by the surveyor's plummet. On the map, by slip of pencil, it read—"Plum Point"—indicative of projection into the river, whereas nothing of the kind existed and plum trees thereabouts were scarce as hen's teeth. From Plumb Point, the route was laid a little east of north to an intersection with the New York & Harlem R. R. at Hillsdale.

In the planning of the Dutchess & Columbia R. R., the practical ability of that eminent Civil Engineer, Oliver Weldon Barnes, whose portrait hangs in the Gallery of the Railway and Locomotive Historical Society, was finely displayed. Starting at Plumb Point, beside the right of way of the Hudson River R. R., his survey steadily diverged from the Hudson until a point was reached where it bent northward and crossed Fishkill Creek. This point was where the rails in due time were laid on an iron deck bridge forty feet above the stream. It was on the border of the fine country seat of Joseph Howland, a General in the Federal Army during the Civil War, and he named it—Tioronda. If you wish to translate this Indian sounding word you might say it meant—"Tumbling Waters"—"Merry Waters", etc, for, no matter how spelled, the majority of these Indian names, where they occur near ponds, brooks, etc. are sagaciously rendered by pundits as "Smile of the Waters", "Hastening Waters", etc. But to return. Having crossed the creek, which here is in a ravine, a tangent with 1% grade carried the line to a graceful curve and reverse through the Village of Matteawan, now united with Fishkill Landing in the City of Beacon.

Another tangent was entered beyond the village. This was in a low valley—or draw—leading due north and trending away from the confined channel of the creek where the western bank was preempted by the extensive Groveville Mills and its brick tenements. It not being expedient to carry the line through these obstructions, the draw was chosen and followed until abreast of the State Criminal Asylum. Here a graceful fill curved east heading against a low ridge which separated the draw from the creek gorge. The passage was at the narrowest part of the ridge so that the rock cut was twelve feet deep and about one hundred long. At the eastern exit it immediately met the gorge. This, when the time came, was spanned by the iron through bridge shown in accompanying photograph by the writer in 1888. Turning up the east side of the gorge, the line presently emerged and entered a level extending several hundred feet. On this level, where Glenham Depot was built, a yard with tracks to shift freight trains was made. The skill shown in skirting the Groveville Mills and in the return to the creek through the ridge barrier was admirable and has stirred me every time it has come in view.

At the Glenham Depot, a spur led through the fine iron bridge (shown in the photograph) to the great Glenham Carpet Mills, then owned by the late A. T. Stewart of New York Dry Goods fame. It was taken down many years ago when the mills were abandoned. You can note Mr. Fouquet, its designer, and his wife (white dress) with Mrs. Whipple (wife of the contractor) standing together. John F. Gerow, who erected the abutments is opposite.

Due to the abruptness of the turn, no locomotive could take the curve, so a yoke of oxen took the cars across, one by one. About 1878, when the mills had shut down indefinitely, the "hay burners" were sold to Robert G. Coffin who had a General Store with Lumber and Coal yard attached at Coffin's Summit. The late Samuel K. Phillips, a director of the N. D. & C. R. R. told me that with his fellow directors he was aboard a "Special Train", running smoothly, when the whistle gave a blast and the train stopped with a jerk about a mile below the Summit. Right ahead, rounding a curve, the "hay burners" with a car were bearing down against the "Special"! Explanation followed. It seemed that Mr. Coffin, who was at the throttle of the "hay burners", being unaware of the "Special", had taken advantage of what he supposed to be a clear track to "distribute" some freight consigned in his care.

At Clove Branch, beyond Hopewell, a tangent through a rather wide valley led two miles to a spur of the ridge nearly meeting a spur of the opposite side. Curving through the gap enabled the line to pass into another basin and brought it through Verbank Village. Ever there was kept in mind attainment of the height of land near Millbrook. By judicious use of wide curves, the divide was surmounted at Coffin's Summit (now Oak Summit) where a lovely view of the mountains beyond the Hudson River presented itself. At one sweep of the eye there trounded in review Storm King; the Shawangunk Range and the Catskill Group. From Millbrook northward no difficulties in construction were to be encountered for the remainder of the line through Pine Plains and Copake was similar to what has been described. If the corporation had adhered to the route projected in 1866, the career of the D. & C. very likely would have been different from what it was, since such a lay out would have led the New York Central & Hudson River R. R. to acquire it as an auxiliary route in connection with the Harlem.

The D. & C. R. R., instead of sticking to this wisely planned Hillsdale route, was lured into diverting it at Pine Plains to a connection with the Connecticut Western R. R. at the State Line. The connection proved non-productive of revenue to the D. & C. because the Connecticut Western, under the charter of the Rhinebeck & Connecticut R. R., extended to the Hudson River at Rhinecliff and routed traffic to the latter point. In the earlier years of the Rhinebeck & Connecticut, coal traffic from the Delaware & Hudson Canal boats was very heavy but you can see that such traffic did not at all enure to the D. & C. So, it lost its original strategic lay out to Hillsdale on the Harlem R. R. and settled down into a merely local line.

Another unwise move at this date (1869), was alliance with the Boston, Hartford & Erie R. R., for this road in turn was allied to a bitter enemy of the New York Central, viz: the Erie Railway and the design to

open to the latter access into choice New England territory was intolerable to the New York Central. Resentment was accordingly visited upon the D. & C. for fraternizing with these foes of the New York Central. The D. & C. had even gone so far as to convey in fee to the Boston, Hartford & Erie R. R., the easterly half of its right of way from Hopewell Jet, south to the Hudson. On this strip it was designed to lay B. H. & E. rails, thus in effect double tracking. The strip, on the foreclosure of the B. H. & E., passed to its successor, the New York & New England, thereby keeping alive the rancor. It still rankled as late as 1893 when a roundhouse fire disabled three of the N. D. & C. locomotives at Dutchess Jet. In this crippled state, tradition whispers, that the New York Central was asked to loan power temporarily until the N. D. & C. engines could be repaired, but that the request was denied and the unfortunate line left to limp along until repairs were completed.

In 1868, the graders set to work at the southern terminus. Grading started at Plumb Point and the rails connected with the rails of the Hudson River R. R. (which was soon to change its title to N. Y. C. & H. R. R.) so that the very earliest train operations began at the Fishkill Landing Station and used the Hudson's tracks to Plumb Point. This was for a short time in 1869 and ended as soon as the D. & C.'s station was finished. After the station building was ready, Plumb Point was placed on the time tables as Dutchess Junction. The yardage was quite extensive. The tracks of the Hudson River R. R. were spanned by an extension of the station roof, thus giving passengers protection from the weather.

At Dutchess Junction, in 1869, the Boston, Hartford & Erie set in place a curved trestle across the shallow bay to reach Denning's Point where channel frontage existed, but before rails were laid all further operations of the B. H. & E. stopped abruptly. The piling was visible in 1882 when the photograph of N. D. & C. #6 was taken but now has disappeared, save the tops sometimes are seen at low tides. After the exit of the B. H. & E., the D & C established a ferry slip opposite the station and for a few years the "Fannie Garner" plied to and fro across the Hudson carrying passengers and such freights as offered. It was given up when the New York & New England constructed its line from Tioronda, going over the New York Central tracks and reaching Fishkill Landing by a piling parallel with the shore and later filled in with earth and cinder. This took place in 1882 and was on an important scale. The commodious "Wm. T. Hart" was crossing constantly to a slip at the Erie yard and daily carried a great number of freight cars used in traffic from Boston to the west. For several years this New York & New England terminal was a scene of great activity and the yard service required the constant use of two powerful switching engines. These were N. Y. & N. E. Nos. 118 and 119. When one of the long freights drawn by a consolidation locomotive started and encountered the grade leading to the bridge over the New York Central tracks and began to slow down, it was quite fascinating to see either the 118 or the 119 rush after it and give a "running boost." It was a queer method but it seemed to answer and after the crash of collision the switcher held its nose close to the rear car and, with noisy exhausts, kept it there while the big consolidation replied far ahead until the Glenham Level was reached.

This terminal lost all activity when a twelve mile road was opened from Hopewell Jet to the Poughkeepsie Bridge and the "Wm. T. Hart" ceased to ply. But we are getting ahead of our story and will return to the days of '68.

In 1868 it had become apparent that, as the graders had advanced northwards from Dutchess Jet, a long distance, the time had come for locomotives to haul rails and ties and the McQueen Works at Schenectady built two on order from the D & C. An item in the "Standard" recited (Nov. 28, 1868) that the pair were on the floor awaiting the D & C's order for shipment. The latter, however, was induced to have the Schenectady Works let the B. H. & E. take them and thus, at the last moment, they were diverted as welcome additions to the above named road's meager resources. On it they retained for a time the names—"Fishkill" and "Dutchess", with numbering "7" and "10". When the Boston, Hartford & Erie met harsh treatment by the Commonwealth and was forced into bankruptcy, the "Fishkill" and "Dutchess" were not extricated from the wreckage but became N. Y. & N. E. property. They are enumerated here, although they did not come to the D & C since they were lettered as of that road.

The diversion of the "Fishkill" and "Dutchess" was supplied by purchase from the North Pennsylvania R. R. of its "Neshaminy" #5, built by Baldwin in 1856. Carrying that name it was put ashore at Plumb Point on February 8th, 1869. There the new name "Tioronda" replaced "Neshaminy" and "D & C R. R." was lettered on the tender.

Although built in 1856, the locomotive was patterned on the style which Mr. Baldwin had adopted ten years earlier, thus giving the engine a decidedly antiquated appearance. And yet it seemed befitting that the first locomotive of the D & C should have the fashion of by gone days, for long before 1866 projectors had espied this passage above the Highland Gateway of the Hudson and had advocated a road from Plumb Point up the Fishkill Creek, through Clove Valley and the pass now used by the N. Y. N. H. & H. R. R. in reaching Poughkeepsie Bridge, to strike across New England. If such a railroad had been built, as was urged by Robert Gosman Rankin in 1848 in a very forcible address, (a copy of the pamphlet in which it was presented can be read at the United Engineering Society Library), there is little doubt that it would have been equipped with just such locomotives as the "Tioronda."

It was a 4-4-0 woodburner with the balloon type of stack having that unmistakable style of M. W. Baldwin and with cylinders so steeply inclined as almost to touch the base of the smoke stack. They were 14x24" and the drivers were five feet in diameter.

Mr. Driscoll, who had been running the "Superior" on the Hudson River R. R. came at the same time and although not the regular engineer of the "Tioronda", sometimes ran it and, in spite of the thronging years since 1869, retains a vivid memory of the engine's many peculiarities.

On February 15, 1869, two more engines arrived from the New Haven & Northampton Co. (Canal Road). Names were lacking but road numbers were "No. 1" and "No. 2". Breese, Kneeland & Co. built them for a road that had failed. They were not delivered and, in 1856

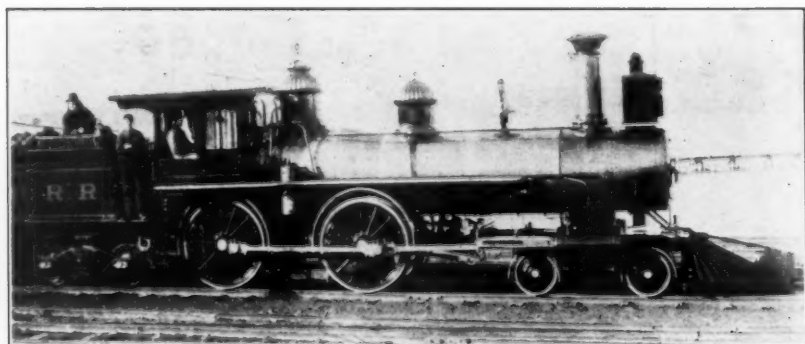


D. & C. R. R. Bridge Over Fishkill Creek at Tioronda



Glenham Company's Bridge

Courtesy of C. B. Van Slyck



D. & C. R. R. #6. Forrest B. Annis, Engr. in Window

Courtesy of C. B. Van Slyck

or 1857 were awaiting sale at Jersey City. James Fox, the Master Mechanic of the Hampden & Hampshire R. R., (which was the Massachusetts portion of the "Canal Road" in those days), purchased them after requiring Breese, Kneeland & Co. to change the drivers from five feet to five feet ten inches. Both, precisely alike, were woodburners. When received by the D & C their tenders were inscribed in bold plain letters—"D & C R. R." The road numbers of "Canal Road" days were replaced by names on the cabs, viz: "Washington" and "Pine Plains". The former was for the township in which Millbrook lies and the latter for the Village of Pine Plains. At times the Engineer of the "Washington" was Dennis John Cassin—in later years noted as Engineer of the "Empire State Express." The D & C, at the time of construction, passed Bangall Mills on a trestle, soon afterwards filled in, but in the winter of 1869-70 it was an open structure, when David Smith of Copake, N. Y. drove by in the tented wagon fitted out as a perambulating photographic "atelier." The "Washington's" fireman, Roswell S. Judson, stood in the gangway and hailed him to stop and take a photograph of the "Washington," Cassin and himself as a memento of construction having reached the Mills. Thus this souvenir, which Mr. Judson prized, was secured and today, in the identical frame provided by him, hangs in the gallery of the Railway & Locomotive Historical Society. Very shortly after the taking of the photograph the strange looking wagon ceased its roving through the countryside for David Smith died at Copake Iron Works and this relic appears to be the only photograph depicting a locomotive carrying on its tender the letters—"D. & C. R. R."

Like the "Tioronda" and "Washington," the "Pine Plains" was an outsider, sporting the great stack which adorned Ante-Bellum woodburners. For about twenty years it led a useful career but in 1876 it was deemed beyond profitable conversion to coal burning. Brought to Dutchess Jet. it stood awaiting sale to some road still using wood and I recall climbing into the cab and, sitting on the right hand seat, to have indulged in boyish fancy that once again we were careering up the line.

About 1915, in Pittsfield, Massachusetts, I met a railroader—William W. Gauthier—who had been the fireman of the "Seminole" when the Kansas Pacific was being extended across the prairies but who had returned home and taken a place on the D & C in its infancy. From Gauthier came the information that the first engineer and fireman of the "Pine Plains," in 1869, were the brothers Moore, who like Mr. Driscoll, had come from the Hudson River R. R. The Moores did not stay long and James, the elder, left railroad work to take charge of an engine in the mill at Stuyvesant Falls near Kinderhook, where Gauthier lost track of him.

These two locomotives from the "Canal Road" were procured through W. G. Van Buskirk, who, in 1868, was running the noted "Irrington," No. 49 on the Hudson River R. R. He paid \$8000.00 for the pair and was appointed Master Mechanic. Three years later he became Master Mechanic of an Ohio road and died at Terre Haute, Indiana, in 1893.

The three locomotives during 1869 and 1870 were in general service. When the line was opened, the regular passenger and freight trains were

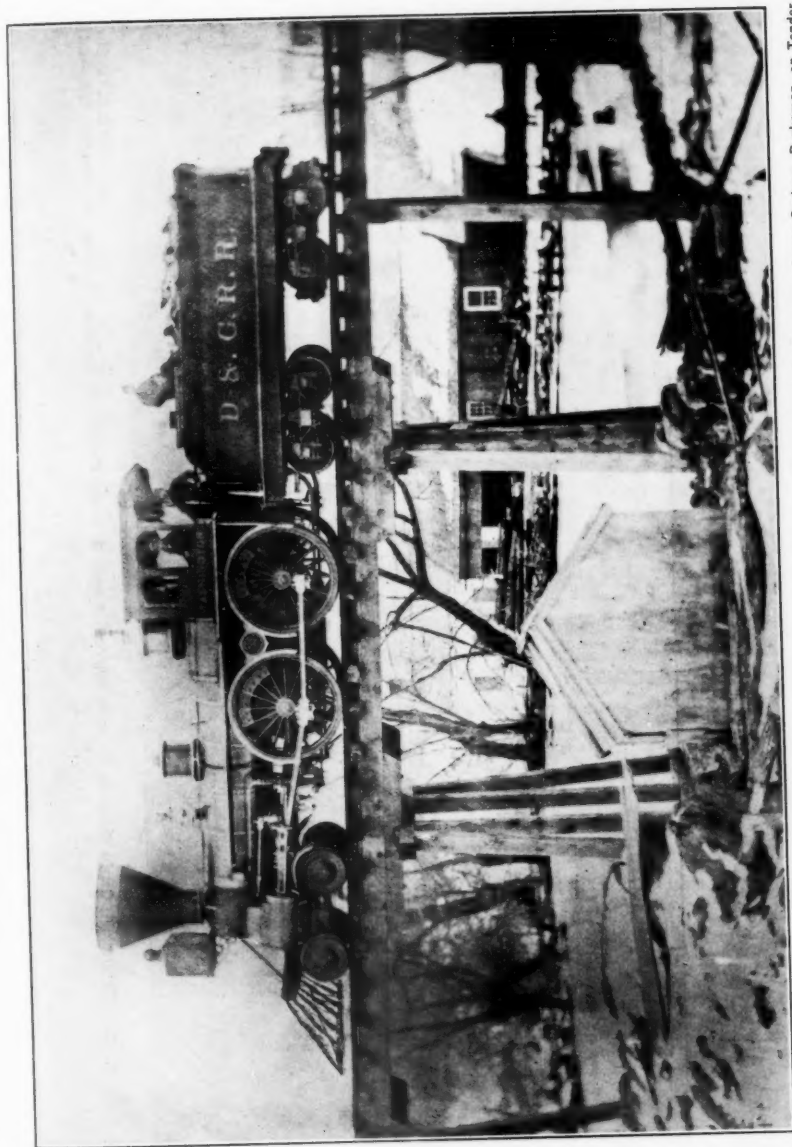
drawn by four new locomotives. Between 1869 and 1872 the equipment was as follows:

"Tioronda"	M. W. Baldwin	1856
"Washington"	Breese, Kneeland & Co.	1857
"Pine Plains"	Breese, Kneeland & Co.	1857
#1 "Millbrook"	Grant Loco. Works	1870
#2 "Bangall"	Grant Loco. Works	1871
#3 "Verbank"	Schenectady Loco. Works	1871
#4 "La Grange"	Schenectady Loco. Works	1871

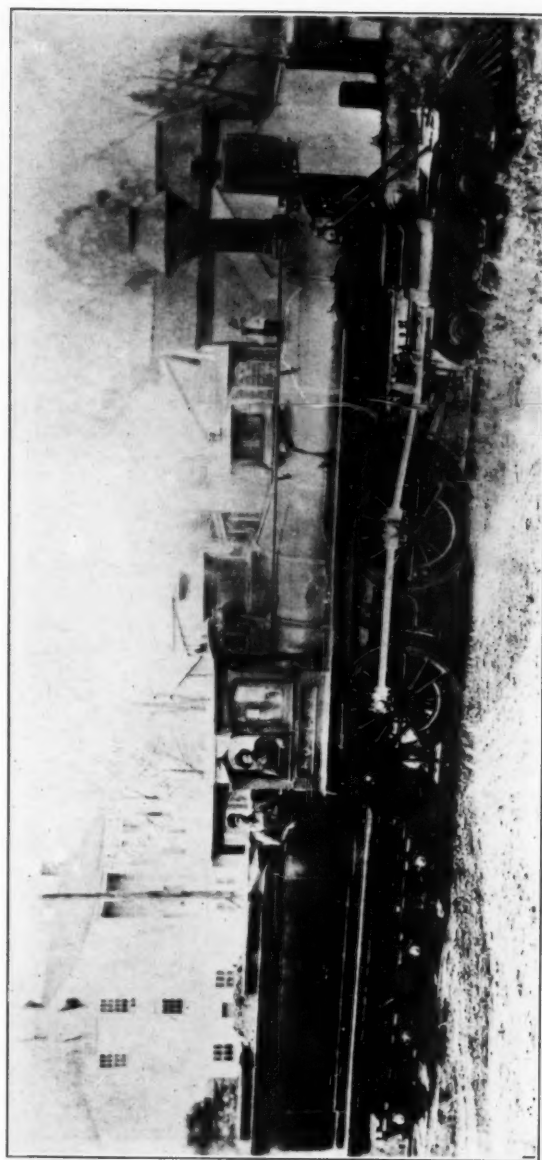
These seven locomotives were the only ones (save the "Fishkill" and the "Dutchess" already mentioned), which were lettered "D & C R. R." The "La Grange" had a large stack but soon this was changed for a diamond, greatly improved appearances, for the first stack was clumsy in design. Memory does not recall the stacks carried by the "Bangall" and "Verbank" when they entered upon service.

Besides the foregoing seven D & C locomotives, three Boston, Hartford & Erie engines are to be mentioned. Two of these were named "Resolute" and "Onward"—the name of the third is not recalled—and were sent from Massachusetts to carry on the construction from Hopewell Jct. eastwardly to Waterbury. Their activity ended abruptly owing to the B. H. & E. bankruptcy already mentioned. The failure led to strained relations between the companies and forced the D & C to debar them from the rails between Hopewell and the Hudson. The late Roswell S. Judson once narrated to me how one midnight Mr. Brown, the D & C President, roused him and he got up steam in the "Washington." About 2 A. M. they started for Hopewell Jct. and "locked out" the B. H. & E. engines by removing the connecting rails. The marooned locomotives later ambled along the D & C to Dutchess Jct. homeward bound. So closed the chapter of the Boston, Hartford & Erie. Some day possibly the story of that ambitious, ill starred corporation may be told, giving an account of its plan to bridge the Hudson at Storm King and, swinging through New York, New Jersey and Pennsylvania, reaching the Anthracite Basin. It, however, does not belong in this paper.

The New York, Boston & Montreal Railway came into our picture in 1872 when the New York & Boston R. R. which then had finished its line from Brewster's Junction south to Highbridge on the Harlem River, added "Montreal" to its title. Its promotors, mostly stock speculators, planned to merge various short railroads then operating independently in the territory beginning at the Harlem River and lying between the Hudson River and New England border and extended as far north as Rutland, Vermont. To link these railroads, then unconnected with one another, it was planned to build the Putnam & Dutchess R. R. from Brewster's to Hopewell and the Pine Plains & Albany R. R. from Pine Plains to Chatham, N. Y., where it would join the Harlem Extension R. R., then opened to Rutland, Vt. At the latter point the N. Y. B. & M. System would join the Central Vermont R. R. which was in close alliance with the Grand Trunk Railway. You see at a glance an advantage the N. Y. B. & M. offered the Grand Trunk in affording a line paralleling the New York Central & Hudson River R. R. all the way to tide water at

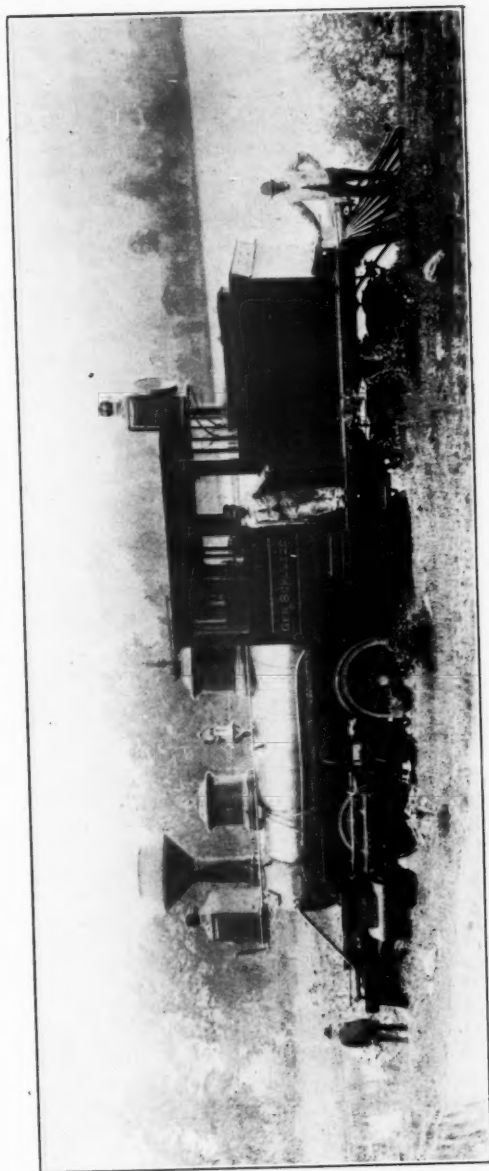


D. & C. R. R. "Washington." Dennis John Cassin, Engr., in Window; Roswell Sherman Judson, Fireman, in Gangway; James Graham, Brakeman, on Tender

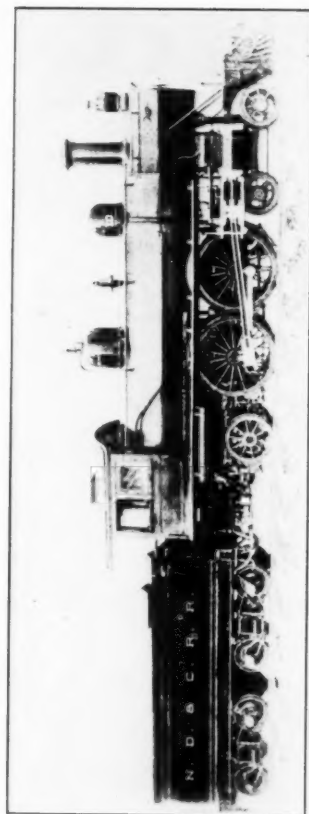


D. & C. R. R. #1—"Millbrook." George Cronkrite, Engr., in Window; Forrest B. Annis, Fireman, in Gangway. Taken at Bangall Mills—1879

Courtesy of C. B. Van Slyck



Clove Branch R. R.—"General Schultze"



N. D. & C. R. R. #10

Courtesy of Baldwin Loco. Wks.

New York City. The New York & Boston owned a fine frontage on the Harlem River and already was busy in preparing it for use.

By the spring of 1873 the N. Y. B. & M. Ry. was actively securing the railroads vital to make a connected line of rails between New York City and the Central Vermont System at Rutland. It expected to unify by exchanging its own first and second Mortgage Bonds, aggregating twenty-five million dollars, for the bonds of the short railroads. These roads were the D & C; New York & Boston and Harlem Extension. The two linked roads were puppets owned by the System and could be built by whatever surplus arose from sale of the first and second mortgage bonds. The outlook for carrying out the plans was promising but in September came the panic and all plans went astray. The consolidation, then incomplete, was broken up and the three short lines reverted to their former independent operation for a brief period.

Preparatory to opening up the System, the N. Y. B. & M. had ordered rolling stock and in 1873 reported an outfit of thirty locomotives. We can figure how many of the thirty were earlier engines then in service on the separate links and how many were new machines coming from the builders. These new locomotives were landed at Dutchess Junction in the summer of 1873. At that date the D. & C., Harlem Extension and New York & Boston appear to have had eighteen, so that the remainder—twelve—represented the new engines. In 1874 it was an amusement of mine to visit the Dutchess Junction Yard and inspect that audience of engines standing there in mediation as to when they would be called into service. I must have noted their road numbers and entered them in my Locomotive register. None had names. The numbers began with "5" and ended with "16" and my recollection is that the tenders were lettered "N. Y. B. & M. Ry."

In this recollection Mr. Van Slyck concurs and reminds me that such lettering replaced "D & C R. R." on those stated at work in 1872. It also is his impression that a few of the new engines were in service a brief time. I rely on his remembrance for the make of these new engines. Nos. 5, 6, 7 and 8 were 4-4-0 diamond stack Brooks. Nos. 15 and 16 were 2-6-0 Danforths. As to the make of the intervening numbers we feel uncertain. We agree that "5" and "6" and "15" after protracted delay took service on the Newburgh, Dutchess and Connecticut R. R. and were remodelled. The photograph of No. 6 shows how No. 5 looked when altered. No. 15 became N. B. & C. No. 8 and was very little altered—the board shield above the first driver, shown in the print of Tioronda Bridge, was the only change, save lettering on the tender.

The late Charles J. McMaster told me that while he was Master Mechanic of the Bennington & Rutland R. R., (which you know emerged from the breakdown of the N. Y. B. & M.), he came to Dutchess Jet. and took away two 4-4-0 Brooks. These were named by the B & R R. R.—"C. E. Houghton" and "H. W. Spafford", who were officers of the road.

A company allied to the D & C, but for legal technicalities keeping its own name, was the Clove Branch R. R. It was a very busy little road tapping an iron ore bank. For about ten years the "Tioronda" and "Washington" gave their service in handling the ore trains between the bank and junction but in 1880 they vanished from Dutchess County and

were replaced by the double-ender Rogers, named "Gen. Schultze", after the manager of the D & C. "Clove Branch R. R." appeared on the stumpy tender while the road numbering was in the N. D. & C. series, viz:—9. In the photograph, taken on the Shore at Sylvan Lake, George Lasher, the engineer, stands in the engine. In 1886 he was killed on the West Shore R. R. when the rails slid into a sudden collapse of the embankment at Milton. When the track of the Clove Branch R. R. was abandoned, the "Schultze" was sent to the graveyard of locomotives—Dutchess Junction—and after long idleness went to a lumber railroad in Georgia.

The first Atlantic type built by the Baldwin Works was N. D. & C. No. 10. This engine was the pride of the road. It tripped along the rails like a Marathon racer. The best of half tones would fall down in portrayal of the barrel's sheen and the gleaming steel as it flew onward in the sunlight.

In the "Gay Nineties", a palatial hotel welcomed guests at Millbrook and sped them. So far as scenery was concerned the hotel's attractions were undeniable. Located on the summit, to which allusion has been made, it commanded prospects of the Catskills and Berkshires. This was Haleyon Hall. The luxury of its appointments cajoled New Yorkers who were sufficiently locuplete to meet its tariff (per diem charges would have gratified "Coal Oil Johnny") and the "Millbrook Special", drawn by No. 10 conveyed them to and fro. How inspiring to watch this eager locomotive leading the "Special" out from Dutchess Jet. at five o'clock in the afternoon. Scarce a train length from the platform ere it was sprinting on the non-stop run to Millbrook. The watcher at the depot could rest assured that "No. 10" would land those dainty commuters at Haleyon Hall in season to don their dinner gowns. Ah me!—changed to No. 40, when the N. D. & C was swallowed by the Central New England Ry.—"No. 10" soon lost its fine appearance and was last seen running out of Pittsfield, Massachusetts.

Summarizing we find the following photographs extant:

- D. & C. R. R. "Washington".
- N. D. & C. R. R. "Millbrook"—taken as No 1—diamond stack
- N. D. & C. R. R. No. 6—taken at Dutchess Junction
- N. D. & C. R. R. No. 8—taken on Tioronda Bridge
- Clove Branch R. R. No. 9—taken at Sylvan Lake
- N. D. & C. R. R. No. 10—Baldwin Locomotive Works half tone.

Without doubt others were photographed but prints have not come to light as yet or may have been destroyed utterly—in fact a print showing the "Tioronda" was destroyed by its dull minded owner in 1911. Being asked why he burned it, he replied,—"It was so old." Search for a duplicate print has been persistent since 1911 but unavailingly.

Following the crash of the N. Y. B. & M. System, the foreclosure of the mortgage on the D & C ensued, and the capital stock was rendered worthless. John Crosby Brown, bid in the assets for a nominal price and immediately there was stenciled on every car, "Mtgs No. — Jno Crosby Brown Trustee." The Receiver of the D & C operated under Court direction until January, 1877 when the newly chartered Newburgh, Dutchess & Connecticut R. R. Company relieved him. Equipment



Courtesy of Mrs. H. H. Reed
Charles L. Kimball, Gen'l Mgr. of N. D. & C. R. R. Photo of 1890



Courtesy of Mr. Driscoll
John Leonard Driscoll—1870.
Senior Engineer—Dutchess & Columbia R. R.

was rented from the Trustee for a year or so and then was purchased.

Upon reflection it appears to me that the N. D. & C. Board of Directors, and the Superintendent, C. L. Kimball, administered the concerns of their road wisely and—not attempting dividend—turned all avails into improvements. The patrons were treated with consideration and the train service was ample. In the years between 1877 and 1907 the road attained an excellent position, although dependent upon local traffic of an agricultural region. The automobile has robbed it of the improvement noted and now the traffic is very slight. Once a day a gasoline car brings passengers from Pine Plains in the morning and returns them at five o'clock. A locomotive pulls a few freight cars on a round trip daily. From Dutchess Jet. to Tioronda; from Cove Branch to Sylvan Lake and from Shekomeko to Millerton the rails are gone and the grade is dense with bushes. A petition to abandon gasoline car service is pending and the sunset of the day of the "No. 10" has fallen!

Nearing the end of my chapter it seems one incident should be narrated and that relates to the roundhouse fire alluded to in the earlier part. There was a colored man named George Washington, who after his emancipation in Virginia, came here and became coachman for a well known family. In 1873 this family was lost when their steamer went down. George then got employment on the N. D. & C. at Dutchess Jet. In 1893, when the fire broke out, he was advanced in years and by no means as agile as formerly but he had quick perception and, despite the rapidity with which the flames spread, he managed to run "No. 1" to a place of safety. The other housed locomotives were reduced to hulks and it took a long time to restore them. I often talked with George but his modesty was such that he never referred to his deed.

N. Y. B. & M. No. 16, Danforth, 2-6-0, was purchased by the Poughkeepsie & Eastern R. R. The Poughkeepsie & Eastern R. R. held aloof from the clutch of the N. Y. B. & M. R. R. but had troubles aplenty of its own. It was finally taken over by Russell Sage and now forms a part of the New Haven System, entering through the Central New England Railway.

The Baldwin Magazine

The file of this magazine in the Baker Library is complete—save for two numbers—Vol. 1, No. 2, October, 1922 and Vol. 1, No. 3, January, 1923. We would like, if possible to complete this file and if any of our members have these copies and they would like to donate them to us, we would appreciate it. We have duplicate copies of Vol. 2, No. 2, October, 1923 and Vol. 2, No. 3, January, 1924 that we would be glad to exchange for them if the owner wishes them. Before sending these needed copies, won't you please write your Editor in the matter.

The Standardization of the Track Gauge on American Railways

By J. H. WESTBAY.

PRESENT exceptions to standard gauge track in this country are few. Some three decades ago, however, track gauge was not standardized and a variety of gauges prevailed on our railroads. Differences in track gauge are recorded almost from the construction of the first railways in England where, at the time the first locomotives were built, they consisted of colliery tramways. The iron rails of these tramways were usually 2 inches wide and were laid 4 feet 8 inches apart so that the extreme width over the rails was 5 feet. Wheels on the tram cars were so placed that the distance between flanges, which ran along the outer edges of the rails, was 5 feet. With the advent of the steam locomotive the pioneer builders, seeing in these tramways a possible market for their machines, desired to build them to meet as nearly as possible the existing conditions. Stephenson, however, modified the practise of flanges bearing on the outer edges of the rails by placing the wheels on the axles so that the flanges would run along the inner edges. Thus was begun a practice which now prevails universally.

When Stephenson made this change in position of wheels on axles he made the gauge of the wheels the same as that of the track; the flanges, therefore, crowded both rails. Obviously such a condition created excessive friction which was responsible for operating difficulties, as was demonstrated in the operation of the Stockton & Darlington Railway, which was built to the prevailing tramway gauge. Stephenson is credited with forestalling such difficulties on the Liverpool & Manchester Railway by laying the track of that road to a gauge a half inch wider than the tramway gauge, or to 4 feet 8½ inches, while leaving the gauge of the wheels unchanged, at 4 feet 8 inches. The half inch lateral play so effectively afforded relief that Stephenson adopted it as the gauge to which he built his locomotives. The new gauge, which was known as the Stephenson gauge, was by no means universally adopted, although it was used by other locomotive builders in constructing engines in competition with Stephenson's.

An outstanding variation from the Stephenson gauge, as well as an extreme in width, was the 7-foot gauge to which the Great Western Railway was built. An extreme in the other direction was the 1 foot 11½ inch gauge of the 14-mile Festiniog Railway in North Wales. Some idea of the total lack of unity in the matter of gauge is conveyed in the statement that ten years after the Liverpool & Manchester Railway was opened the railways in operation in the British Isles consisted of 1522 miles of line built to five different gauges. It is rather significant that the greater portion of this mileage was built to the Stephenson gauge.

The locomotives used on America's first railroads were built in England. Lack of an established track gauge on the new American roads, as well as on those in the British Isles, afforded builders an opportunity to use their discretion in the selection of gauges to which to build these locomotives. This made it feasible for the new roads to defer

laying their track until after the arrival of their first locomotive and then lay the track to the gauge of the engine. Stephenson built a number of locomotives for certain of the new American roads and built them to his previously-adopted gauge of 4 feet 8½ inches. This marked the beginning of the use of this gauge on American roads.

For a time after the establishment of the first locomotive works in this country these plants followed the precedent of British builders, and built engines for new roads to gauges of their own choice, letting the roads lay their tracks to the gauge of the engines. Eventually, however, came the time when the gauge to which a railroad was to be built was determined prior to construction, and motive power and rolling stock were built to the proper gauge on order of the purchaser.

Lack of a standard gauge was responsible for a multiplicity of gauges on American lines; railroads in different parts of the country seemed to prefer different gauges. For example, roads in New England were built for the most part to Stephenson's gauge of 4 feet 8½ inches, as were also the Illinois Central, the Baltimore & Ohio and the Vanderbilt systems. Railroads in the southern states used the 5-foot gauge almost exclusively, and it is interesting to note that the Louisville & Nashville made a change of gauge as early as 1855 to conform to this southern choice. The L. & N. had been planned as a 6-foot gauge road and some two miles of main and one-half mile of side track had been so built. The annual report of that road for the year ending October, 1855, in commenting on the change, states that "In the prospect of forming Southern connexions, deemed by the Board of the utmost importance, as tending to produce a unity of interests between the Louisville & Nashville Road and railroads south of its terminus, assuring an augmentation of business, and in times of emergency affording reciprocal advantages in the transportation and travel of the two sections, it was thought wise to change the gauge of the road from six to five feet. The entire south have adopted the five-foot gauge. Experience has almost fully demonstrated to those who have observed the practical workings of the different gauges that the five foot is the best. * * * It is believed by the Board that the change will, in the construction of the road and its future equipment, diminish expenditures at least two hundred thousand dollars." The five-foot gauge, besides being the choice in the south, was designated by the legislature of the State of California as the standard for railroads in that state. On Canadian roads a gauge of 5 feet 6 inches prevailed and the same gauge was used generally by railroads in the State of Missouri as well as by certain lines in Texas.

The apparent advantages of the 6-foot gauge were recognized elsewhere than on the Louisville & Nashville. The New York & Erie, the Atlantic & Great Western, (which roads later became a part of the Erie) and the Ohio & Mississippi (now the Cincinnati-St. Louis line of the Baltimore & Ohio) were built to that gauge. The New York & Erie and the Atlantic & Great Western formed a continuous broad-gauge route between New York and Chicago, and these roads, together with the Ohio & Mississippi formed a similar route between New York and St. Louis except for a gap of some 60 miles between Dayton, O., and Cincinnati. In order to complete the route rail was laid to a 6-foot gauge on the narrower-gauge tracks of the Cincinnati, Hamilton & Dayton between

Dayton and Cincinnati, and under a trackage agreement with this road traffic moved over the broad-gauge New York-St. Louis route.

By 1860 considerable railroad mileage had been built in the states east of the Mississippi River and a few lines extended west to the Missouri River. Beyond here there were no railroads and but few navigable streams, so that practically the sole transportation routes were those afforded by the comparatively few trails and wagon roads. Growing interest in the western country led to consideration of the possibility of a railroad to the Pacific coast. Government aid was sought for such a project and various routes were surveyed west from the Missouri River to the coast. In making preliminary plans attention was given to a suitable gauge to which the proposed railroad might be built. It is recorded that Gen. W. J. Palmer, who was greatly interested in the extension of railroads into the west, was sent to England to make a study of railways in that country. The question of a suitable gauge was prominent in his mind and he devoted considerable thought to that phase of his study while abroad. From his observations he concluded that the Stephenson gauge of 4 feet 8½ inches would not be feasible for roads of such magnitude as that proposed to the Pacific, chiefly on account of construction costs. He was impressed by the 1 foot 11⅞ inch gauge Festiniog Railway in North Wales and considered it the model to which the so-called Pacific railroad should be built, except that its gauge should be 3 feet. While participating in some of the surveys of the proposed route he took advantage of the opportunity to broadcast his enthusiasm for the 3-foot gauge. His argument in regard to its economy of construction was timely in view of the tremendous drain upon the country's financial resources which the Civil War was making at that time; and he succeeded in creating a great deal of enthusiasm in favor of the narrow gauge.

Following completion of the several surveys and the selection of the route, Congress, on July 1, 1862, approved "An Act to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific coast, and to secure to the Government the use of the same for postal, military, and other purposes." By this act the Union Pacific Railroad Company was created and authorized to build a railroad from the 100th. meridian west to the western boundary of Nevada Territory. Another road, the Central Pacific, was projected to be built eastward from the Pacific coast to connect with the Union Pacific at its western terminus. The Act of 1862, above referred to, contained the provision that "the track upon the entire line of railroad and branches shall be of uniform width, to be determined by the President of the United States, so that, when completed, cars can be run from the Missouri River to the Pacific Coast * * *."

Advocates of the various gauges began almost immediately their attempts to influence the President in his choice. It is a matter of record that upon consultation with his Cabinet President Lincoln determined upon the 5-foot gauge for the proposed railroad. Instead of settling the question, Lincoln's choice only served to create further agitation. Immediately dissatisfaction was forthcoming from all interested parties except those who looked with favor upon the 5-foot gauge, whereupon Congress repealed that section of the Act of 1862 which gave

the President authority to fix the gauge of the proposed railroad. Proponents of the 3-foot gauge shared the enthusiasm of Gen. Palmer and were active in their efforts to influence the adoption of that gauge. The influence of eastern lines which were built to the 4-foot 8½ inch gauge was exerted in favor of that gauge. Interests connected with 5-foot gauge roads were active in their efforts to secure confirmation of Lincoln's choice. The dispute was carried to Congress where it was the subject of some very interesting argument.

Particularly interesting in these days of efficient railroad operation, with our present fast trains, both freight and passenger, and through car routes over long distances, were the arguments by those interests which favored the 5-foot gauge and who desired breaking gauge at the eastern terminus of the Union Pacific. It will be sufficient to note in passing that gauge-breaking was argued as a matter of both safety and good business; that goods could not be safely shipped from the Pacific coast to the Missouri River without a change of cars enroute, for it would not be safe to run cars for so great a distance in a continuous trip; that such transfer at the middle point (perhaps near Salt Lake City) and again at the gauge-breaking point would stimulate business at those stations; that if the Union Pacific were built to the 4 ft. 8½ in. gauge its cars would be used by other roads of that gauge and they would get to such distant points as Baltimore, Portland and Boston and carry traffic on lines radiating from those centers, thus getting away from the control of the owning road. Figures were presented which indicated that transfer costs would average 7 cents per ton at gauge-breaking points, and the argument was advanced that the railroads "can better afford to break gauge and pay the expense themselves" than to let their cars get so far away from their own rails.

Following these arguments, Congress, on March 3, 1863, by a vote of 26 to 9, approved an act which provided "That the gauge of the Pacific railroad and its branches throughout their whole extent, from the Pacific coast to the Missouri River shall be, and hereby is, established at four feet eight and one-half inches." Construction was begun on the Union Pacific at Council Bluffs, Iowa, and on the Central Pacific at a point near Oakland, California, and terminated when the tracks of the two roads met near Promontory Point, Utah, where the golden spike was driven May 10, 1869.

The construction of the 4ft. 8½ in. gauge of such a railroad as the Union Pacific did not have an immediate stabilizing effect on the gauge question. Gen. Palmer was keenly disappointed that his suggested 3-foot gauge had not been adopted. His later activity in the promotion and construction of the Denver & Rio Grande Railroad influenced the selection of the 3-foot gauge to which that road was constructed. The main line of the railroad was built to this gauge from Denver to Pueblo, across the Continental Divide over Marshall Pass and on to Ogden, Utah, besides which various branches were constructed.

Besides the narrow-gauge lines built by the Denver & Rio Grande considerable mileage of similar line was built in Colorado by the Colorado & Southern Railway. This road was started as a standard-gauge line and was built from Denver to Golden in 1870. Two years later a third rail

was laid between these points and construction was begun on a narrow-gauge extension west from Golden which was completed to Black Hawk in 1872 and to Central City in 1878. The line was later built to Georgetown and Silver Plume, over the scenic Georgetown Loop. Between 1874 and 1884 this road built a narrow-gauge line between Denver and Leadville, and another was built through Buena Vista and Gunnison to Baldwin.

Construction of narrow-gauge lines was not limited to mountainous country. Between 1874 and 1883 some 780 miles of 3-foot gauge railroad lines were built in Ohio, Indiana and Illinois, as follows: Toledo, O. to East St. Louis, Ill., 450 miles; Delphos to Dayton, O., 98 miles; Mercer to Shanesville, O., 4 miles; Dayton to Wellston, O., 160 miles; Wellston to Ironton, O., with branches, 18 miles; Shakertown to Dodds, O., Cincinnati to Waynesville, O., and Cincinnati to Venice, O., totalled approximately 50 miles. In 1883 these lines were consolidated to form the Toledo, Cincinnati & St. Louis Railroad.

Another narrow gauge railroad, the Kansas Central, built about 55 miles of line between Leavenworth and Holton, Kansas, in 1871-2, and in 1877 extended it about 27 miles farther, to Onaga, Kansas. Later extensions were made so that when complete in 1882 the road extended from Leavenworth west for about 166 miles to Mintonvale, Kansas.

By 1870 the railroads of the United States represented a more or less conglomerate assortment of gauges. Some idea of the lack of uniformity in this respect is conveyed by the following table which represents the situation in the late '60s.

Railroad	State	Mileage	Gauge
Albany & Susquehanna R. R.	N. Y.	103	6 feet
Albany & Florida R. R.	Ala.	114	5 feet
Atlantic & Great Western R. R.	N. Y., Pa., Ohio	507	6 feet
Belvidere & Delaware R. R.	N. J., Pa.	67	4 ft. 10 in.
Bellefontaine R. R.	Ohio, Ind.	202	4 ft. 10 in.
Central Ohio R. R.	Ohio	137	4 ft. 10 in.
Cincinnati, Hamilton & Dayton R. R.	Ohio	60	4 ft. 10 in.
Cumberland Valley R. R.	Pa., —Md.	74	6 feet
Delaware & Hudson R. R.	Pa.	32	4 ft. 8 in.
Delaware, Lackawanna & Western R. R.	Pa., N. Y., N. J.	251	4 ft. 3 in.
Erie R. R.	New York	460	6 feet
Galveston, Houston & Henderson R. R.	Texas	50	5 ft. 6 in.
Hackensack & New York R. R.	New Jersey	13	6 feet
Houston & Texas Central R. R.	Texas	80	5 ft. 6 in.
Illinois Central R. R.	Illinois	365	4 ft. 8½ in.
Kentucky Central R. R.	Kentucky	99	5 feet
Lackawanna & Bloomsburg R. R.	Pa.	80	4 ft. 8½ in.
Lake Erie & Louisville R. R.	Ohio, Ind.	175	6 feet
Maine Central R. R.	Maine	110	4 ft. 9¼ in.
Portsmouth Branch R. R.	Ohio	56	5 ft. 6 in.
North Missouri R. R.	Missouri	170	5 ft. 4 in.
Pacific & Missouri River R. R.	Missouri	283	5 ft. 6 in.
Pittsburgh, Ft. Wayne & Chicago Ry.	Pa., Ohio, Ind., Ill.	468	4 ft. 10 in.
Sandusky, Mansfield & Newark R. R.	Ohio	117	4 ft. 9½ in.
Sycamore & Cortland R. R.	Illinois	4½	4 ft. 8 in.
Tyrone & Clearfield R. R.	Pa.	23½	4 ft. 5½ in.
Virginia & Tennessee R. R.	Va., Tenn.	204	5 feet
Wilton R. R.	N. H.	15	4 ft. 7 in.

By about 1870 railroad traffic had increased until it constituted a burden of no small consequence at gauge-breaking points. The necessary transfers not only caused delay but were expensive. It was necessary to provide at such points facilities for handling locomotives, cars, and all other equipment of both gauges, as well as to maintain yard and other tracks for both gauges. In order to reduce the volume of traffic actually transferred to a minimum, it became the practice to change trucks under cars whose lading was destined beyond the gauge-breaking point and handle the car through. Obviously it was necessary that the car return via the same gauge-breaking point through which it had already passed in order to replace its trucks. The number of cars which were so handled through any gauge-breaking point depended upon the number of available trucks at that point.

The operating difficulties which inevitably increased with the volume of traffic almost naturally brought consideration of a uniform gauge. Furthermore, with the gauge of the Union Pacific Railroad established by Act of Congress, it seemed logical that connecting roads, at least, should consider a similar gauge if they were to share in the traffic of that road. Accordingly a movement toward the adoption of the 4 ft, 8½ in. gauge as standard was apparent about 1870. Among the first of the larger roads to change their tracks to this gauge was the Ohio & Mississippi. The change from 6-foot to standard gauge was accomplished on this road on July 4, 1871.

The Kentucky Central, now a part of the Louisville & Nashville, was originally a 5-foot gauge road, and was changed to standard on July 10, 1881. The change to standard on the Louisville & Nashville was accomplished on Sunday, May 30, 1886, when the main, branch and side tracks were changed in a day. Preparations had been under way for several years, however, so that by the time the tracks were changed a considerable number of locomotives and cars were ready for service on the new gauge. The change in the cars involved merely replacing of the wide gauge trucks by those of standard gauge. The alteration of the trucks themselves consisted in removing the wheels and pressing them off the axles, turning the wheel fit on the axles long enough to permit mounting the wheels 1¼ inches inside their original position, and pressing the wheels on in this new position. Locomotive changes consisted chiefly of resetting all driving tires 1¼ inches inside their former gauge and replacing the engine and tender trucks by similar trucks of the new gauge.

The actual track change was accomplished, as stated, on May 30, 1886. A few days previously the spikes were pulled from alternate ties along the inside of one rail of all tracks, and by use of a small steel gauge the spikes were driven in such a position that the rail, when shifted in against them, would be to the new gauge of 4 feet 8½ inches. Arrangements were made to suspend all train service on the day of the change, and the last trains which moved before actual track work was begun displayed signals which had been previously designated to convey that information. The track change was accomplished by dividing each section gang into two crews which started from the same point and worked in opposite directions until met by a crew from the adjoining

section. It is said that by 6 p. m. of May 30, standard-gauge trains started to move over tracks which some eighteen hours before had been 5-foot gauge. This is a noteworthy accomplishment when it is recalled that more than 2000 miles of track had been changed.

The same year, 1886, came the change to standard from the 6-foot gauge on the Erie. This change, unlike others of similar magnitude, was made on a week-day instead of a Sunday or holiday. It was originally proposed that the work should be done on a Sunday, but the then Chief Engineer, Mr. Charles Lattimer, was opposed to Sunday work, and his objections prevailed to delay the change for two days.

By 1886 the narrow-gauge lines which had comprised the Toledo, Cincinnati & St. Louis Railroad, previously referred to, were reorganized, and the 450-mile section between Toledo and East St. Louis alone remained intact. It was reorganized in June, 1886 to form the Toledo, St. Louis & Kansas City Railroad. Work of widening the gauge to standard was begun immediately and was completed prior to June, 1889. This road eventually became the Toledo, St. Louis & Western R. R. Other of the narrow-gauge lines which in 1883, with the Toledo-East St. Louis line constituted the Toledo, Cincinnati & St. Louis were disposed of to various interests, rebuilt to standard gauge and eventually became parts of other systems.

In the west the Denver & Rio Grande found the disadvantages of narrow-gauge operation so great, especially at points where connections were made with roads of other gauge, that about 1880 consideration was given to the widening of the gauge to standard. In 1881 was started the work of laying a third rail on their tracks at Denver and by the end of 1890 the main line had been widened over the entire distance between Denver and Ogden, Utah. The work included the construction of a new route which crosses the Continental Divide over Tennessee Pass. Operation is still maintained over some 842 miles of narrow-gauge line on the Denver & Rio Grande Western, included in which is the original route over Marshall Pass, between Salida and Montrose, Colorado, as well as numerous branches in that state and New Mexico. Until a comparatively few years ago three-rail main track was maintained from Pueblo to Salida to accommodate both narrow and standard gauge equipment.

The Colorado & Southern continue operation over some 242 miles of narrow gauge main lines which include those between Golden and Silver Plume, 32.28 miles, Denver and Leadville, 143.64 miles, and Como and Alma, 31.67 miles, besides four short branches. Operation of both standard and narrow gauge trains continues over 33.64 miles of three-rail main track. The yards of this road in Denver, and those of the Denver & Rio Grande Western in Salida present interesting examples of three-rail track layouts. Standard gauge yard engines in service at these points are equipped with a unique design of coupler-pocket casting which contains three pockets so arranged that standard pilot couplers may be inserted for handling either standard or narrow gauge cars. Certain narrow gauge yard engines on the Denver & Rio Grande Western are similarly equipped.

The Kansas Central Railroad, previously referred to, was reconstructed as standard gauge in 1889 and 1890. The line was transferred,

under foreclosure proceedings, in 1897 to the Leavenworth, Kansas & Western Railway Company, and was sold to the Union Pacific in 1908.

Gauge changes continued until, with but relatively few exceptions, the railroads of the United States and Canada are now built to the standard gauge of 4 feet 8½ inches. Such exceptions as still exist are narrow gauge roads; the broad gauge lines have all been rebuilt to standard. Among the few narrow gauge railroads still in operation, besides the lines of the Colorado & Southern and the Denver & Rio Grande Western, are the Uintah Ry., a 70-mile line between Mack, Colorado, and Watson, Utah, and a branch of the Chicago, Milwaukee, St. Paul & Pacific between Bellevue and Cascade, Iowa, 35.77 miles long. The abandonment on June 30, 1931, of the 112-mile Ohio River & Western Railway between Bellaire and Zanesville, Ohio, marked the passing of one of the few remaining narrow gauge lines.

For their cooperation in furnishing information concerning their respective railroads acknowledgment is made to Messrs. R. C. Gowdy, Chief Engineer, Colorado & Southern Railway; F. R. Ramsey, District Engineer, New York, Chicago & St. Louis Railroad; F. M. America, Editor, Erie Railroad Magazine; T. E. Owen, Editor, Louisville & Nashville Magazine; L. Adams, Chief Engineer, Union Pacific Railroad.

BIBLIOGRAPHY

- "Railways of the World", by F. A. Talbot.
- "A History of Travel in America", by Seymour Dunbar.
- Misc. Doc. No. 108, 37th. Congress, 2nd. Session.
- Congressional Globe, 37th. Congress, 3rd. Session.
- "Baldwin Locomotives."

The Battle of Gauges in Canada

By ROBERT R. BROWN

IN CANADIAN railway history the outstanding mistake was the adoption of a standard gauge which was different from any gauge used in the nearby States, except Maine where the use of the 5' 6" gauge originated. The first railways in Canada were small portage lines, of little importance, and the gauge did not become a problem for some years. The earliest lines adopted the Stephenson gauge of 4' 8½", not with the idea of establishing a standard gauge, but because of the indirect influence of Stephenson and Hackworth, builders of the first locomotives used in Canada.

The establishment of a standard gauge was a difficult problem for the Canadian Legislature as Canadians were inexperienced in such matters and at that time there were half a dozen common gauges in the United States and two in England.

In Bulletin 18 Mr. Loye suggests that Canada adopted, in 1845, the so-called Portland gauge of 5' 6" for political and military reasons but those were only some of the minor reasons advanced by some of the "Experts" who were only too pleased to give their opinions to the Railway Committee of the Legislature and actually this gauge did not become officially the standard gauge in Canada until 1851, after many miles had been built.

During the middle forties it was realized that Canada could not survive as a separate country unless a railway was built to some ice-free port on the Atlantic seaboard and for a time there was great rivalry between the cities of Boston and Portland for the privilege of handling the Canadian traffic. The early construction of the Vermont and Canada Railway to Rouses Point, to connect there with the Champlain and St. Lawrence Railroad, promised an all-rail route from Montreal to Boston and actually that was the first through line opened. In 1845, to meet this threat, some energetic gentlemen in the city of Portland, ambitious of obtaining something of that railway aid which had contributed so much to the success of Boston, conceived the idea of tapping the St. Lawrence, at Montreal, by a railway over the route of the White Mountains, through the forests of Maine, New Hampshire, Vermont and Canada. Having enlisted Montreal in the project, they took the precaution to bind the Canadians, under seals and penalties, to adopt the exceptional and peculiar gauge of 5' 6". An elaborate and sententious report was prepared which proved to the unsophisticated Canadians that by the adoption of this great improvement in gauge, Boston and New York would be distanced and the great western trade would be diverted from the New York route and sent to Montreal and Portland.

Mr. Myles Pennington, first Freight Traffic Manager of the Grand Trunk Railway and a man who was in a position to know, stated, "On visiting Portland in 1853 I was curious to enquire into the history of the 5' 6" gauge, and was informed that it had been adopted in order to make Portland the terminus of the Canadian roads and prevent the trade from going past Portland to Boston."

Thus it would seem that the ultimate origin of the broad standard gauge in Canada was the rivalry between two American cities.

Turning now to official records, in the Minutes of the Railway Committee of the Legislature of the Province of Canada for the year 1851 we find that the Committee consulted a considerable number of experts, engineers and arm-chair critics in connection with the gauge question. These included;

John Young, Vice-president of the St. Lawrence and Atlantic Railroad, who naturally had to recommend the adoption of the Portland gauge of 5' 6".

T. C. Keefer, a famous Canadian civil engineer, who favored the Stephenson gauge of 4' 8½".

Charles Seymour, chief engineer of the State of New York, who was influenced by the Erie Railroad and favored a wide gauge of 6 feet, but recommended 5' 6" for Canada.

James G. Ferrier, president of the Montreal and Lachine Railroad, favored 4' 8½".

R. W. Harris, president of the Great Western Railway, favored 4' 8½" because his railway was to form a connecting link between the New York Central, at Niagara Falls, and the Michigan Central, at Detroit.

R. G. Benedict, chief engineer of the Great Western Railway, favored 4' 8½" for the same reasons.

Erastus Corning, of Albany, N. Y. advocated a gauge of 4' 8½" because that was the prevailing gauge in the adjacent States.

James Gould, car builder of Albany, N. Y., pointed out the advantages and disadvantages of the different gauges but would not commit himself.

H. H. Killaly, engineer of the Department of Public Works, favored the wide gauge of 5' 6", probably because he considered it expedient to do so.

John A. Roebling, civil engineer and bridge builder, advocated the 4' 8½" gauge.

Most of the practical railway men favored the Stephenson gauge of 4' 8½" but other influences were at work; the representatives from Montreal and Sherbrooke were already committed to the broad gauge and certain plausible arguments in favor of the broad gauge were thought to more than offset any disadvantages. The principal reasons that influenced the selection of the 5' 6" gauge included:

1. The Montreal and Portland line, which had adopted the broad gauge in 1845 for reasons already given, was now (1851) under construction and nearly completed.
2. At the Portland Railroad Conference in 1850, the broad gauge had been adopted for the proposed European and North American Railway, which was to extend from Portland to Canso, Nova Scotia, forming a through route from Montreal to Nova Scotia by way of Portland, Bangor and Saint John. Because of this the broad gauge became the standard in Maine, New Brunswick and Nova Scotia.
3. That trade with the United States should be restricted as much as possible.
4. That it was in the interests of the country that the trade of Canada be forced to flow east and west.
5. That a break in gauge at the border would prevent invasion. This was a very poor reason as there were several standard gauge lines, either in operation or under construction, running into the very heart of the country.

After hearing all the pros and cons, a number of resolutions were jammed through by the Railway Committee on July 31st 1851:

1. That the question of the gauge to be adopted for the Grand Trunk Railway be now taken under consideration by the Railway Committee. Carried, 9 for, 1 against.

2. That in the opinion of this Committee the medium gauge of 5' 6" is the most favorable to the interests of Canada and should be recommended to the House. Carried, 9 for, 2 against.
3. That in the opinion of this Committee, the said gauge of 5' 6" should be adopted as the standard gauge for the Grand Trunk Railway and also that the Government should recommend its adoption by the directors of the Great Western Railway. Carried, 9 for, 1 against.

Thus the 5' 6" gauge came to be adopted as the Provincial Standard Gauge in Canada and it continued as the official standard gauge for over 20 years.

The Great Western Railway, which was not restricted to any particular gauge by its charter, had decided on 4' 8½" but polite threats from the government compelled the adoption of the broad gauge. This change practically destroyed the usefulness of the Great Western Railway and several years later a third rail was put down to accommodate the standard gauge cars of the New York Central and the Michigan Central.

The Grand Trunk Railway adopted a different method of overcoming the difficulty. About 400 cars were built with adjustable wheels. The wheels could be unlocked and moved on the axles to suit the different gauges and at each break of gauge, at Montreal and at Sarnia, there were special tapered sidings where the wheels were forced apart or together.

During the late sixties, Robert Fairlie was advocating the construction of very narrow gauge railways to be worked by bogie type locomotives. This influenced the building of the Toronto, Grey and Bruce, the Toronto and Nipissing, the New Brunswick and the Prince Edward Island Railways, all of which were 3' 6" and also the Philipsburg, Farnham and Yamaska and the Glasgow and Cape Breton, both 3' 0". These were all changed later to 4' 8½", though narrow gauge trains were running in Prince Edward Island until 1931.

In 1892 several suburban electric railways were built in the neighborhood of Toronto, which adopted the astonishing gauge of 4' 10⅞". Why this was done is not clear unless it was to make use of second hand rolling stock.

The broad gauge lines were changed to 4' 8½" between 1870 and 1890, except the Carillon and Grenville Railway which continued as the only broad gauge line until it was abandoned in 1910.

At the present time there are three short lines which are not 4' 8½"; the Nipissing Central, the White Pass and Yukon and a short C. P. R. line in the Rockies; all narrow gauge.

Important Dates in Connection With the Gauges in Canada

		GAUGE UNKNOWN
1823	Quebec Incline Plane	
1829	Albion Mines Railway	4' 8½"
1836	Champlain and St. Lawrence Railroad	4' 8½"
1847	Montreal and Lachine Railroad	4' 9"
1847	St. Lawrence and Atlantic Railroad	5' 6"
1849	St. Lawrence and Industrie Village Railway	4' 8½"
1852	Ontario, Simcoe and Huron Railway	5' 6"
1853	Great Western Railway	5' 6"
	Grand Trunk Railway	5' 6"

1854	Nova Scotia Railway	5' 6"
	Bytown and Prescott Railway	4' 8½"
	Carillon and Grenville Railway	5' 6"
1856	Buffalo and Lake Huron Railway	4' 8½"
1857	European and North American Railway	5' 6"
1859	Stanstead, Shefford and Chambly Railway	4' 8½"
1867	Great Western Railway	Third rail for double gauge
1869	Brockville and Ottawa Ry.	5' 6"
	St. John and Maine Ry.	5' 6"
	Windsor and Annapolis Ry.	5' 6"
	Quebec and Gosford Ry.	4' 8½"
1870	South Eastern Ry.	4' 8½"
1871	Toronto, Grey and Bruce Ry.	3' 6"
1872	Grand Trunk Railway	Gauge changed to 4' 8½" west of Toronto
1873	Grand Trunk Railway	Gauge changed to 4' 8½" between Toronto and Montreal
1874	Grand Trunk Railway	Gauge changed to 4' 8½" east of Montreal
1875	Intercolonial Railway	Gauge changed to 4' 8½"

Officers of the N. Y. Chapter

At a meeting of the New York Chapter held on March 24th, 1934, the following members were nominated and elected directors of the New York Chapter for one year: Messrs. J. B. Ennis, Henry Parsons and Thomas T. Taber; for two years: W. J. Coughtry, Edward Hungerford and C. L. Winey and for three years: T. B. Annin, W. A. Lucas and A. Sheldon Pennoyer. At a meeting of the Directors of the New York Chapter held on March 29th, the following officers of the New York Chapter were elected to serve until April 1, 1935: Thomas T. Taber, Chairman; W. J. Coughtry, Vice Chairman; Thomas B. Annin, Secretary and A. Sheldon Pennoyer, Treasurer.

A Trip Over the Two Old Overland Trails From California Into Nevada

By D. L. JOSLYN and E. W. YOUNG

DURING the month of July, after some writing back and forth, it was decided that we should take a trip over into Nevada going over one of the old overland trails and returning the other. It was finally settled that we would make the trip the latter part of August. Believing that perhaps the members of the Railway and Locomotive Historical Society would be interested in what we saw, we have set forth our discoveries in the following.

Mr. Young arrived in Sacramento early Sunday morning, the 20th of August and after a hasty breakfast we set forth via the Placerville route, to see what we could find in the way of railroads and railroad material. Our route lies out thru the valley following the old Sacramento Valley Railroad, which is now merely the Placerville branch of the Southern Pacific. We pass thru the great heaps of boulders thrown out by the dredgers in their search for the precious yellow gold and off to our right across the railroad tracks, we see one of the giants at work tearing up the fertile land and leaving in its stead a trail of rocks where nothing henceforth will grow.

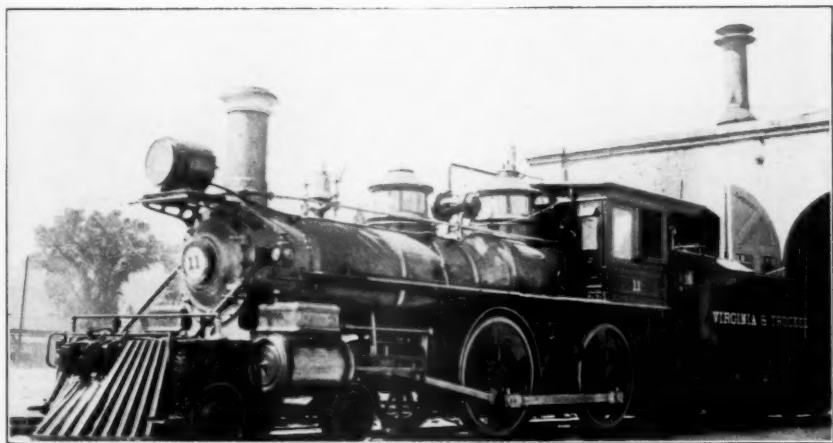
Arriving at the deserted town of Negro Bar, where now stands but two houses to mark the spot that was once a thriving village, we cross the tracks of the railroad into the town of Folsom. On our left we look down upon the spot where in the 60s were located the shops of the S. V. R. R. And they had quite good sized shops there in those days, as not only railroad work was done, but also much mining machinery was made, as well as other things, such as stoves and castings of all kinds. Nothing now remains but a barren field, and under some giant blue gum trees are a number of unemployed men with their camp.

Passing on thru Folsom, our route is almost due east and we enter the low foothills of the Sierras, leaving the railroad to wind its way far to our left as it seeks the easiest way thru the hills, but finally at White Rock we come upon the railroad again and cross it. At Shingle Springs we once more cross the railroad and shortly arrive at the old mining town of El Dorado. Nothing remains of the glory that was, as mining gave out years ago and as the town was all but wiped out by a fire a number of years past, the gaunt remains of the business section stand as mute evidence of what once was the thriving mining town.

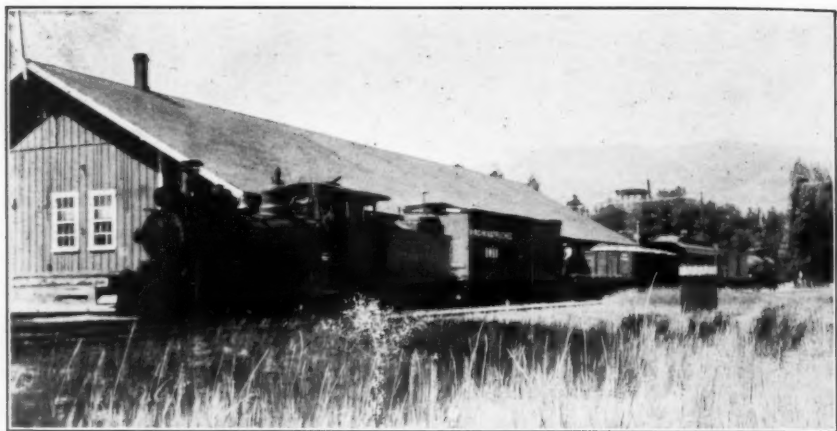
From here we make a detour into Diamond Springs to visit the shops and mill of the Diamond and Caldor Lumber Company. Their shops are closed down and we found seven Shay engines under some sheds and one Shay engine out in the open as it is used daily as a switcher. This is a three foot lumber railroad and it was the first time that we had ever seen a narrow gauge Shay engine. The Diamond and Caldor is about 60 miles in length and extends back into the mountains from whence logs and lumber are hauled to Diamond Springs and from there shipped over the Southern Pacific. The company has an engine



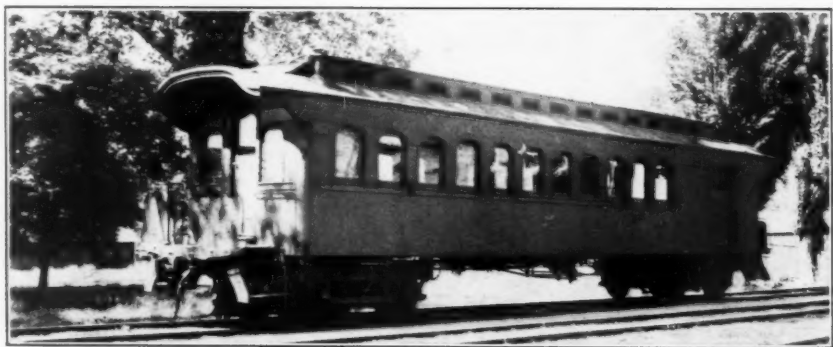
Sacramento Valley R. R. Shops, Turntable, and Station at Folsom About 1859



Virginia and Truckee No. 11. Baldwin 1872. Still in Service, 1933



The Once a Week Train Making up at Carson City, for Mound House, Gold Hill & Virginia City.
Locomotive 25, Baldwin, 1907.



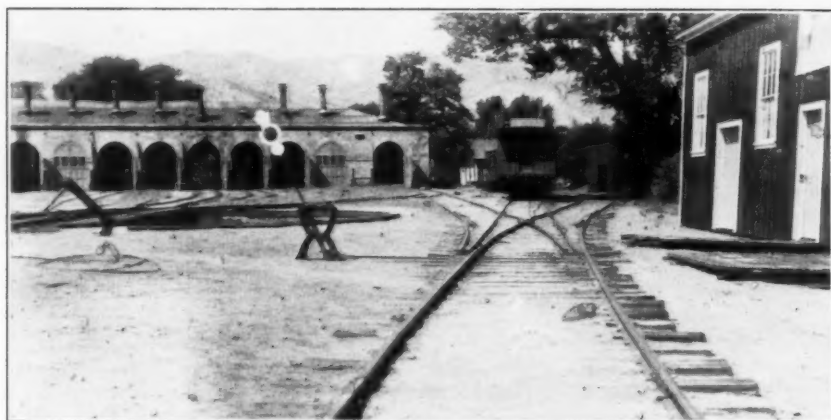
Passenger and Baggage Car Virginia & Truckee R. R.



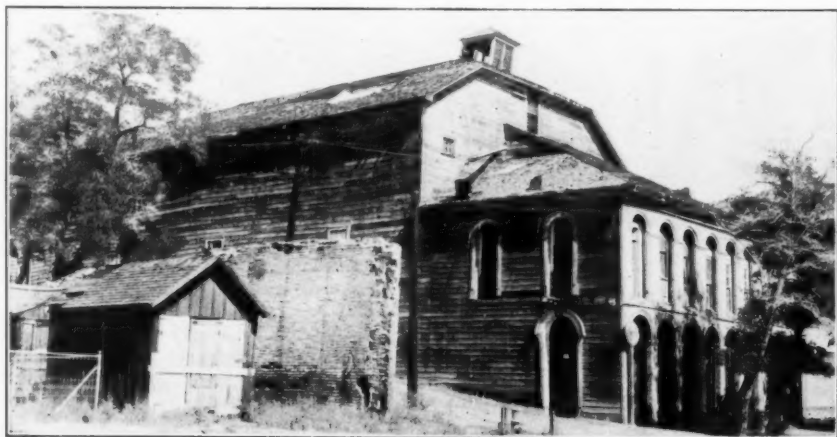
Interior of Passenger Coach, Virginia & Truckee R. R. Note the Old Oil Lamps, the Decorations on the Bead Lining and Clerestory, the Ornamental Cast Iron Seat Frames, Etc.



Station and General Offices of the Virginia & Truckee R. R. at Carson City, Nevada



Three Point Stub Switch, Old Style Cast Iron Switch Stand and Target at Carson City Engine House of the Virginia and Truckee R. R.



The Opera House at Virginia City, Nevada

house, machine shop and the usual pits and facilities for repairing railroad equipment.

To Placerville it is only a few miles and we are soon there. And who has not heard of Placerville? Eight miles to the north east, at Coloma, James Marshall discovered gold in 1848 and started to the west that horde of pioneers in search of the yellow metal that nature has made so hard to secure and which mankind finds ever harder to hold.

In the early days, Placerville was called Hangtown, and it is so indicated on the older maps. It is a picturesque place perched on the side of the hill and if one gets back from the main street, there is much of the past to be seen and many interesting places to visit. But the main part of the town has gone modern with the coming of the automobile and there are smart cafes, gas stations and garages on every hand. Placerville, it will be remembered is where Studebaker got his start, making wheelbarrows and shovels for the miners and afterwards branching out to make wagons and buggies.

We stopped here for a short time to visit an antique shop but found little railroad material, so passed on our way. Placerville is the terminus of the Placerville branch of the Southern Pacific. And from Folsom to this point was the line of the Placerville & Sacramento Valley R. R., which later and is still the Southern Pacific.

Much gold was taken from the red earth in and around here in the early days, but more gold is being taken out now in the form of fruit and grapes, than was ever taken out in metal. Placerville is noted for its Bartlett pears, its apples and fine grapes, and on every hill, down in every hollow and gully, where ever they will grow, will be found fruit trees and grape vines. The scrubby oak and white pine have given way to a more useful tree.

From here to Camino, runs the line of the Placerville, Camino and Lake Tahoe R. R., a road that once dreamed of building over the mountains to Lake Tahoe and even thought of building into Nevada and on east. It gave up the ghost at Camino and is now merely a lumber road that makes one round trip a day between Camino and Placerville. Their shops are at Camino, and we learned that they have several Shay engines, but this being Sunday the place was closed and the engines were in a shed, locked up.

After leaving Camino the road becomes steeper and we know by the sound of our engine that we are ascending a steep grade. We keep steadily on our way, rising higher and higher and soon plunge into the forest and our road winds along beside the roaring south fork of the American River. We see many summer homes along the river as this is an ideal place to spend a week end or a vacation.

Finally we reach Riverton where the pioneers forded the river but where we find a beautiful concrete bridge and after crossing, keep on up thru the grand old pines, tamarack, cedar, red wood, silver fir and dogwood.

And now out of the canyon rises a solid granite bluff to a height of 2,000 feet above the bed of the river. It stands out so bold and sharp in the thin mountain air and has neither fissure nor seam from the bottom to the top of its bald head. This handiwork of nature, man has called

"Lover's Leap" and we were sure that did a lover become disappointed or discouraged in love, one leap from the top would end for all time, his or her sorrows. This giant seems to block our path, but the pioneers found a way around and the present highway follows the old pioneer trail.

We have now ascended to 7,000 feet above sea level and our breath is short, there is a ringing in our ears and our motor gets sluggish, our roaring river has dwindled to a babbling brook, the summer homes and resorts increase and we know that we are near the top. Passing a fine big summer resort and numerous smaller ones, we round a curve and here is the summit as far as our road is concerned.

There is a platform erected out on a point where one may view the grand scenery and it is worth our time to stop and take a look. Down below us, nearly 2,000 feet, is the mountain valley and covered almost entirely with a virgin forest whose trees look so small that it seems like looking down on some child's game. Off to the north, 14 miles distant, sparkles the blue waters of that gem of the Sierras, Lake Tahoe, while on our right rises a majestic peak some 11,000 feet. Across the space is the forest, and we can trace the road that leads to the Kit Carson trail. On our left is another mountain peak not quite so high, rising sheer from the valley and on the side of this peak is the road down which we must pass. We notice many autos coming up the grade, laboring along, taking their time to make it.

After one long last look we descend the grade and in a short time are on the shores of Lake Tahoe, whose waters are here of a silver hue, there a deep gold and out farther are of so deep blue color that one would expect a glassful of water dipped from the lake to be blue in the glass, but such is not the case as the waters are crystal clear. Fish can be seen swimming at a great depth under a boat. It is the reflection of the surrounding mountains and the different depths of the water that give the varied hues.

Many beautiful private homes line the shores of the lake, also there are some splendid summer resorts and a free camping ground where one may pitch his tent and enjoy the swimming, boating and fishing. And now we notice a peculiar thing. Whereas on the California side, (the state line passes thru the lake) there are virgin forests, on the Nevada side the mountains are bare of trees except at some few points on the shores. Inquiring into this we are told that man, the great destroyer of nature, has cut the mighty forest for his selfish use.

In the days when mining flourished in Nevada, lumber camps and saw mills were established on the Nevada side, the trees were felled, made into mine timbers, taken to the top of the mountain on a narrow gauge railway whose grade was so steep and curves so sharp, that it took three of the narrow gauge moguls to haul 3 and 4 cars of timbers to the top. From thence, they were shot down the mountain in a V-shaped flume to Carson City or Washoe City and taken to the mines on the Virginia & Truckee R. R. Placed in the mines to support the different stopes and drifts, they have long since rotted away.

On the sides of the mountain can still be seen the old grade of the Carson & Tahoe Lumber and Fluming Company. Finally when the for-

est had all been cut out, the little railroad was taken up, moved to the north side of the lake, built into Truckee from Tahoe City and became the "Lake Tahoe Railway & Transportation Co." It was a beautiful and scenic ride from Truckee to the shores of Lake Tahoe over this little road, winding along beside the Truckee River, thru the dense forest, crossing many sparkling streams, here and there a small clearing with a farm house and garden. Finally the Southern Pacific acquired the narrow gauge road, broad gauged it and in so doing destroyed a scenic trip as there was not the romance attached to the big steel passenger cars and shiny Pullmans that there was to the little wooden cars with their small square windows, wooden seats and stove in the corner, the smell of the burning pine from the big diamond stack of the little wood burner.

Now, trains do not run to Lake Tahoe except on special occasions and for the hauling of freight now and then. The busses have taken away what business remained after the private autos had a fine wide highway built in for them.

After stopping for a short time to admire the beauty of the lake and its surroundings, we proceeded on our way skirting the shores for a few miles, finally heading into the mountains passing between Job's Peak and Silver Mountain thru Clear Creek Canyon. In these later days there is no water in Clear Creek, but in the winter and spring, the stream is running full.

Emerging from the pass we come in sight of the great Carson Valley and the desert country opens before us with its sage brush, tumble weeds, sand, rocks and stillness. And here we notice what a great many have noticed before us, and that is, the distances are so deceiving on the desert. An object miles away will appear just a short distance off. Across the valley from us are some great barren hills rising from the desert, that appear just a short distance away and we are astonished to learn that they are 30 miles distant.

Around a bend in the road we see Carson City, off in the distance, in its surroundings of poplar trees and we are convinced that it is just a mile away, but soon learn that it is actually 9 miles.

To those who have never been on the desert we might say they have missed something. There is something fascinating about the desert that attracts and holds the attention of one, while the desire is always to see and feel its spell again. True, there is the sage brush, tumble weed, mesquite, sand and more sand, rocks lifting their heads above the surroundings, coyotes, jack rabbits and sage hens. Also it is not well to get lost in that great trackless wilderness.

But there is that feeling of how small one really is in that great, wild open space, the stillness with not a sound except the low rustling of the sage brush as a gentle wind stirs it, and off in the distance that purple that comes down from the sky to meet the desert. A person has to visit the desert to get the full benefit of its gripping influence; to fully appreciate the beauty of it all.

Arriving at Carson City, the capital of Nevada, we put up at as nice a hotel as one could wish for, or find anywhere. We are tired after our trip, which we have made in about seven hours including all stops on the way. The trip can be made in much less time when one is not out to see the sights.

In the morning, after a good nights rest, and a night so still and void of noises, that one had a sense of being isolated from the rest of the world, we set out to see the work shops and yards of the Virginia & Truckee Railroad which are at this point. We found Mr. Murphy, the General Manager, to be a most obliging man and he made us right at home on the instant. The Master Mechanic, Mr. Rulison was also very obliging and gave us the run of the place. I may add here that most of the employees of the Virginia & Truckee have been with the road for years, and we're told the youngest man had nearly 40 years service. That speaks well for the road I am sure.

When one steps into the yards of the Virginia & Truckee Railroad, one steps back 30 years as far as appearances go. We simply did not know where to start! They have a well equipped machine shop, engine house, foundry, car and paint shop, power plant and several smaller buildings all well ventilated and heated. Everything is kept right up to date and nothing is allowed to run down. Buildings all neatly painted, everything orderly and in its place. Ties kept up and not allowed to rot, track well ballasted and rails all looked good. The rails are light and, we should judge not over 62 pounds.

The buildings were nearly all erected in the 70s and are, for the most part made of stone, altho the station, which also contains the general offices, is of wood, as is also the car and paint shop.

The motive power in use, is all kept in excellent repair. The cars are neat and clean and kept painted, while the windows are never allowed to get like some of the car windows that I have seen on larger roads. The cars are small and old, having been built in the late 60s and early 70s. They are painted a yellow color, with pea green trimmings, gold lettering and red numbers, reminding one of the long ago. The quaint roofs and open platforms, the small windows and the ornamental iron seat frames, the head linings and clerestory inside, all decorated, remind one of things that are not generally seen in the modern day passenger cars.

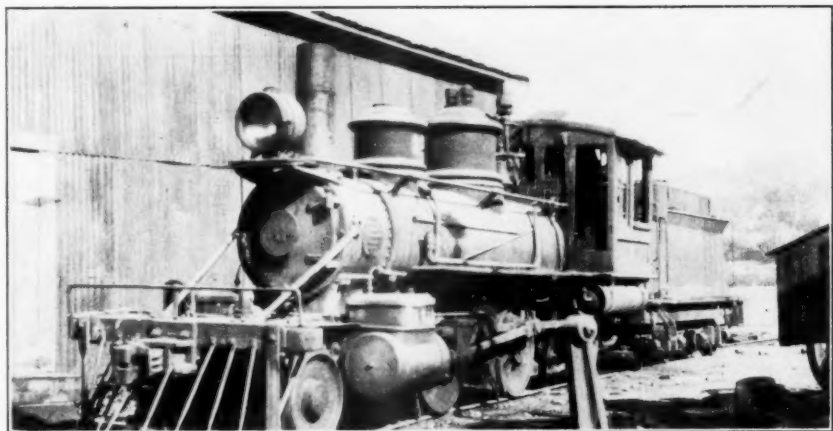
We were particularly interested in the old stub switches with their cast iron stands and the targets, such are not seen any more, except in out of the way places; the old hand operated turn table and such things.

In the house was a Shay engine which we promptly passed up as being too common to notice, but just beyond the Shay was the number 12, still with its Laird stack, evidence of wood burning days. We were told that this engine was run in the house in 1908 and had never turned a wheel since. It was an eight wheel Baldwin and while the year built could not be seen on the builders plate, the name "M. Baird and Co." could be plainly seen and the builders number 3090 leads one to believe that the engine was of the vintage of 1872. There was no pilot on this engine, but there were so many of the old time and early day practices about the engine that a picture for our members would have been taken, but for the fact that we could not get the engine out of the house and, room was not sufficient to take an indoor picture, so we sadly passed up this old bird.

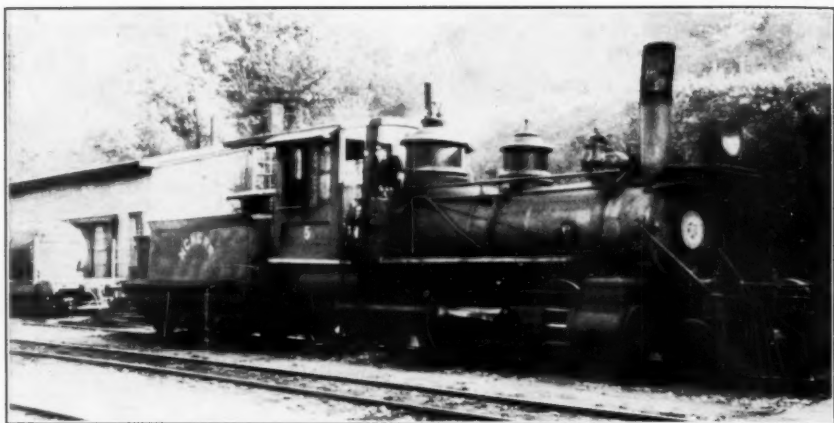
Next to the 12 was the 18, built by the Central Pacific R. R. at Sacramento, and, according to the records in the Superintendent's office



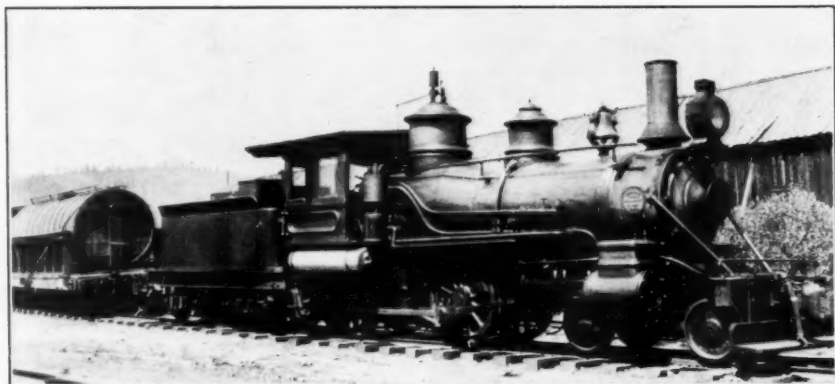
Main Street in Virginia City, Nevada. Wells Fargo Building Fallen in on the Right



Nevada County Narrow Gauge #2. Baldwin, 1875. Three Foot Gauge



Nevada County Narrow Gauge #5. Formerly Carson & Tahoe Lumber and Fluming Co. "Tahoe." Baldwin, 1875. 3 Ft. Gauge



Hobart Southern R. R. No. 5. Formerly Eureka and Palisade R. R. No. 4 "Eureka." Baldwin, 1875, 3 ft. Gauge.

at that point, was built in 1872, but the V. & T. said they bought it in 1874. There was no builder's plate on the engine, as the Central Pacific always placed their plates between the two drivers and when the air brakes were applied the plates had to come off.

This engine was serviceable and is used in the winter to buck snow. The huge wedge plow was on the front and from what we could learn is never taken off, but left there ready for service. This engine had many old time Central Pacific ear marks on it and we would like to have had a picture, but could not get the engine moved out of the house. The bell stand on the 18 is of the type the C. P. cast using an old Mason stand for a pattern.

Next in line was the 22, a Baldwin eight wheeler, their number 3093 but the date had been removed from the plates on this engine, so we could not learn the date built. The 22 had not been in service for quite some time. To all appearances it was still serviceable.

And then came the old number 11, the pride of the Virginia & Truckee R. R. Passengers on the S. P. will recall seeing this engine at Reno as it hauled the passenger train from Carson City to Reno and return for years and was kept up so clean and bright that it attracted the attention of every one. The 11 was built by Baldwin in 1872 and is still serviceable. She was Baldwin's number 2816 and from all accounts has been steadily employed on the V. & T. from that date until recently when she was set aside and only used on special occasions.

Rare indeed is the opportunity to see an engine as old as this, still in service, with all the old earmarks about her. Brass bands holding the Russian iron jacket in place, brass hand rails and grab irons, brass around the steam chests and brass cylinder head covers. Mud guards between the drivers with a deep edging of brass. Every part of the engine and tender just as clean and spick and span as could be. Not a drop of oil where it did not belong. She was, of course, cap stacked and the cap was of brass. The only odd thing about the engine was, the old style head light bracket out from the short smoke box and resting on it a tiny electric headlight. It needed a big oil headlight and a diamond or even Laird stack to complete the picture. This engine was moved outside for us to get a picture.

There were also in the house the 25 and 27, which were both ten wheelers and were Baldwins of 1907, builder's numbers 25016 and 31341. The 26 was at Reno and came in with the mixed train while we were there. She was also a Baldwin ten wheeler.

After a day well spent in looking over the shops and yards and taking pictures here and there, we decided to pass on and see some of the sights along the historic part of this famous old railroad. That is, the part that was first built between Carson City and Virginia City.

A short ride and we come to Mound House, where at one time the V. & T. transferred passengers and freight to the Carson & Colorado Railroad, a narrow gauge line, then running into the interior of Nevada, and in turn transfer was made to the Tonopah & Goldfield R. R., which was also narrow gauge at that time.

For years, all passengers and freight for the Tonopah & Goldfield and the mining regions of Bodie, Aurora and Rhyolite, came from Reno

off the S. P. and were taken to Mound House for transfer to the C. & C. Then the S. P. acquired the Carson & Colorado R. R. and made it broad gauge. Transfer was then a simple matter as the Virginia & Truckee is broad gauge and the Tonopah & Goldfield was finally broad gauged, and all was well. The Virginia & Truckee prospered once more as in the days of the Comstock boom.

Finally the S. P. got to thinking, "Why should we divide our profits with that little 52 mile road? We will just buy it!" Easier said than done! The V. & T. was a paying road and they asked a large price for their road, in fact more than the S. P. would pay, so the deal was off. Then the S. P. cast around for another way out, the result being that they built a line of their own from their main line at Hazen down to Churchill on the old C. & C. Thereafter little business passed thru Mound House over the V. & T. Today, Mound House is silent and deserted and there is little evidence to indicate that this was once a busy railroad terminal. No longer do trains come up from Churchill and the tracks across the desert from Mound House to Churchill are a streak of rust and from the looks of things, the desert will soon reclaim its own.

In the old days of the narrow gauge, it was customary for one or two of the little engines to lay over night at Mound House. The engine house is still there, but with broad gauge tracks running into it, while there are some immense props against the side of the old building to keep the fierce desert winds of winter from blowing the shed away, altho there would be no harm were the wind to pick the building up and smash it on the desert's dusty floor.

We passed on over the divide into Silver City and from the looks of things here it is almost impossible to realize that this was once a very lively place. There is still some mining going on and some of the old tailings are being worked over with good returns, but most of the town has fallen down, or carted away, until little remains.

Gold Hill is a little better off, but the 6,000 folks who once lived here, live somewhere else now and whole rows of business blocks are silent and deserted. The railroad still maintains a station here and some freight goes in and out but very little. The post office is still doing business, as the horde of visitors who come in here during the summer months, like to mail cards from Gold Hill. Near here the V. & T. passes thru a tunnel and is carried across the canyon on a high trestle called Crown Point Ravine trestle. Old pictures show a train of cars on this trestle opposite the dumps of the mine. Huge tailings here testify to the mining that was once carried on, and in the palmy days a bus line made 15 minute trips between Gold Hill and Virginia City, in addition to which the V. & T. had frequent train service.

From Gold Hill to Virginia City is but a short distance and we are soon there. We stopped at the top of the hill and looked down into the all but deserted Virginia City and a wave of sadness and resentfulness swept over us as we looked upon the ruins of that once prosperous city of 35,000 souls and realize that if they can claim 500 now, they are doing well. A whole street of silence and deserted business houses! The once great office of Wells, Fargo & Co. where millions of dollars in bullion passed thru, now fallen in and a wreck. Two and three story buildings

leaning over and about ready to topple down. The large opera house, where once the stars of the stage played before a crowded house, where President Grant was tendered a reception when he visited there, where Mark Twain, Thomas Edison and a host of others well known to the world, visited, now a deserted wreck with a sign warning all comers to—"Keep Out Danger".

The once fine residences of the mine superintendents, with all the fine carved wood work, fancy grilles and beautiful pilasters, now dilapidated and woe begone. The great church where once hundreds of the pious worshipped on a Sunday, now about ready to topple over. A little further along stands the big steel and brick safe of the Virginia Consolidated Mine, all that remains of the place, the buildings having long since joined their kindred-dust. A truly sad sight and more so when we stop to think that the bullion receipts of this famous mine, were once twenty-four million dollars a year and once paid its stock holders over a million dollars a month in dividends.

We visited the silent station of the Virginia & Truckee where once 52 trains a day arrived and departed and from where now but one train a week comes in and goes out, with a couple of cars of freight and maybe one passenger, more often none at all. The car shed stands at the end of the station and has a full quota of passenger cars wondering what has become of the crowds of yesteryear. We finally leave this place of memories and pass on down Gold Canyon to Dayton.

It was in Gold Canyon where gold was discovered that started the once prosperous Virginia City. And here is how the city got its name.

In the days when only a few miners huts stood on the spot soon to become world famous, an old miner lived, with the name of Virginia Pete. He was quite a character in these parts and well known to every one. One evening, as he was returning to his camp after securing supplies, as well as several bottles of red-eye, as well as having consumed a goodly portion, he slipped and fell breaking one of the bottles of whiskey. As he surveyed the remains of the fire water running down the rocks, he hurled the remainder of the bottle against a big boulder and in his tipsy way said, "I christen thee Virginia, in honor of myself, by G—," and the name stuck. There were witnesses to this event.

So we passed on down thru Gold Canyon where the early prospectors ran onto a tough bluish ore that was hard to get out of their pans, and which they cursed and called bewitched, not realizing that it was almost pure silver, and which they dreaded to find, as they considered it bad luck to find it in their pans. At the end of Gold Canyon is Dayton, where the remains of the oldest trading post in the west still exists. This post was established by the Mormons in the early 40s, and past this old post, on across the ford in the Carson River, up over the hills to the east, the remains of the old pioneer trail can still be traced. This trail was made by the gold seekers in their mad rush to get to California, not realizing that they were passing over a vastly richer field than any they would find in that "El Dorado" that they sought.

From Dayton we went over to the Sutro tunnel which was driven into the mountains by Adolph Sutro of San Francisco, for the purpose of getting the water from the mines at Virginia City. As the mines

were down so deep that it was a problem to get the water out with pumps. This tunnel was commenced in 1869 and finished some ten years later. It is 14 feet wide, ten feet high, and extends back under the mountains some five miles. In it are pipes for carrying off the water and a narrow gauge mine railroad for hauling out the base ore, thereby saving the cost of lifting it to the surface and disposing of it. The railroad was operated by mule power, some of the motive power still being in the round house (corral) at the tunnel. The tunnel is still kept in excellent repair, a caretaker living on the premises, making daily trips into and thru the bore to watch for rotting timbers, replacing them when found. The pipes in this subterranean cavern are running full of water, which flows off into the Carson sink, where the waters of the Carson and Humboldt River disappear beneath the desert.

Mr. Sutro built for himself, on a knoll overlooking the mouth of this great bore, a fine residence. It still stands and is occupied during some of the year by the present members, so we were not permitted to visit it much as we should like to, as we were told the inside was finished in magnificent style, and there was much carved wood work etc.

Having seen all there was to see at Sutro, we retraced our steps to Carson City, following the old overland trail instead of going back thru Virginia City. From Carson City, we passed on thru Washoe City which is now a ghost town, but which was a thriving village in the days when the V flume brought down its mine timbers and cord wood from the top of the mountains to the west. In the distance can be seen the Bower's mansion, built by Bowers and his Scotch wife in the palmy days of yore, and which, when built, had door knobs of supposed pure silver and for which Mr. Bowers always thought were such, but his widow found to her sorrow were merely plated, the French firm that supplied the knobs from Paris having plated iron knobs instead of making them from the silver sent over by Mr. Bowers. This old mansion is now a resort where dancing to the tune of a jazz orchestra is one of the principal attractions.

A little further on we stopped at Steamboat Springs to watch the boiling hot waters coming from the earth, as they have done from time immemorial, where there is now a public bath house, resort and gas station.

We went on thru Reno to Sparks, where the S. P. Co. have their division point and repair shops. At this point the big engines that bring the trains over the mountains are detached and the smaller engines attached for the run across the desert. Did not find much of interest at Sparks, except some of the little narrow gauge engines of the old Nevada, California & Oregon R. R., which are standing on the dead line waiting to be broken up. The S. P. acquired this road some few years ago, broad gauged it and extended it to meet their line over the Siskiyou Mountains into Oregon. The engines were taken to Mina and used for a short time on the S. P. narrow gauge, and, some of the largest of them are still at Mina. The smaller ones are to be broken up for scrap, when scrap becomes of any value.

From Sparks, we went on over the old trail into California, following the beautiful Truckee River from Verdi to Truckee. At this latter point we found the old round house of the S. P. which was built in 1869,

fast falling into ruins. The reason for this is, that when the S. P. double tracked their mountain right of way, straightened out curves and got the big new power, trains are run straight thru from Roseville to Sparks and helpers are no longer needed from Truckee to Summit on the return trip. The place looked desolate enough and outside of the fire engine with steam up, there was nothing to see at this once busy place.

From Truckee we made a detour over one of the worst roads we were ever on, and which had the nerve to call itself a highway. It was necessary to take this road to get to Hobart Mills, as we wanted to see the Hobart Southern Railroad. The Hobart Southern is a lumber road, operating narrow gauge trains into the mountains to bring in logs for the mill, and a broad gauge road from Hobart to Truckee for the transport of finished lumber and bringing in supplies.

In the yards here, we found one of the old Eureka & Palisade narrow gauge engines built by Baldwin in 1875, their number 3763, originally Eureka & Palisade No. 4, named "Eureka", but now Hobart Southern No. 5, and despite its age was in excellent condition and in daily use switching around the yards and making a trip into the forest with a train load of supplies when the occasion required. There were several other narrow gauge engines in the house and one came in with a train load of logs while we were there. This was the number 6 built by Baldwin 1906, their number 27923. On a siding was the broad gauge number 8, Baldwin 1907, their number 32160, type 2-6-2 and, in the house were two more 2-6-0 narrow gauge engines, another broad gauge and a couple of Shay engines.

But what took our eye more than anything else, was, in the darkest corner of the house, the old "J. W. Bowker" of the Virginia & Truckee Railroad, which had been sold to the Hobart Mills years ago. It looked about the same as the picture that we have of it, taken by Baldwin when built in 1875, the only difference being, the name was gone from the cab and there was a big wooden snow plow in front where the pilot used to be. But the old style stack as shown in the picture was still on it, the old wooden cab, the pump on top of the boiler, the same tender, cross-head pump and all. We were sorely disappointed that we could not get this old engine outside to take a picture, but were told that it had not moved a wheel for ten years or more altho it was still serviceable. Built in 1875 by Baldwin, it was their number 3689, Hobart Southern number 21, type 2-4-0.

Returning to Truckee over the corduroy road, we went on up to Donner Lake and visited the spot where the Donner party of immigrants put in such a hard winter in 1846-47 and where nearly the whole party of 80 or more were frozen to death that terrible winter. There is a monument erected to their memory at this spot, also much commercialism in the shape of a lunch room, antique shop, garage, gas station and camping grounds for tourists. Nothing is sacred any more!

After taking a picture of the monument, we went on to the top of Donner summit and looked back into the valley below. Here it was that we experienced one of those freak Sierra storms. A cloud no larger appearing than our hand drifted over the sky, a slight wind came up and in a few minutes the hail was coming down so thick that we could

hardly see the road. However, we had a good driver and proceeded on our way and soon ran away from the storm.

Our route is down the side of the mountain across the canyon of the Yuba River, and we can see the snow sheds of the S. P. winding along like some huge serpent. Now we lose the snow sheds as we enter the dense forest, but soon it is in sight again winding along the edge of the granite bluffs, until coming to a place where there was no longer a footing, plunged into a tunnel and emerging on the opposite side, bridged a roaring mountain torrent on a high steel trestle and plunged into another tunnel to emerge on the other side with a sure footing once more.

Arriving at Blue Canyon, we find conditions the same here as at Truckee. Nothing alive about the place but the fire engine with steam up and, attached to a string of water cars ready at a moments notice to tear off and put out a fire that might start in the snow sheds or along the right of way in the forest. Blue Canyon was once a very busy place, but the double tracking, the coming of the big power and the loss of business by the railroad has taken away the glory that was.

At Colfax the same conditions exist as at Truckee and Blue Canyon. The round house is silent and deserted and there are no engine crews stationed at this once busy place. From Colfax we detoured thru the forest to Grass Valley to visit the shops of the Nevada County Narrow Gauge R. R., which are at this place. We left Colfax nearly one half hour after the narrow gauge train, yet we caught up with it, passed it, and waited for its coming so that we could get a picture, went on into Grass Valley, missed our way and had to retrace part of the route, yet, we were at the station waiting when the little train pulled in.

We found the number 1, with steam up and the hostler kindly moved the engine so that we could get a picture. This engine and the No. 2 were the first engines that this road had and while the No. 1 is still in service the number 2 was out on the dumps, having been damaged in a fire. These engines were built by Baldwin in 1875, their numbers 3762 on the number 1 and 3758 on the number 2, names when built, "Grass Valley" and "Nevada". The number 5 was also outside the house and this was one of the original Carson & Tahoe Lumber and Fluming Company engines that helped to move the forest from the slopes of Job's Peak to the V flume for delivery to the mines at Virginia City. It was built by Baldwin in 1875, their number 3709 and is type 2-6-0, still in service. The number 1 and 2 are 4-4-0. The number 7 brought the train in from Colfax and is one of the old South Pacific Coast Narrow Gauge engines, and while there were no builders plates on this engine, we learned from records that we have that she was built in 1877 by Baldwin, sold to the Lake Tahoe Ry. & Transportation Company in 1906, type 4-4-0, no record of when acquired by the Nevada County road. The 8 was also in the house being fitted for service and this was one of the old D. & R. G. engines just bought by the road, type 2-8-0. The No. 1 and 8 have since been badly damaged by fire that all but destroyed the engine house.

From Grass Valley we went on down to the historic old town of Auburn to look over the railroad relics in the Freeman Hotel at that point. From here we took the old back road to Folsom to try and trace

out the right of way of the Sacramento, Placer and Nevada Railroad built in 1862 from near Folsom to Wildwood which was afterwards called Auburn station. This road only existed a short two years and after being abandoned, the tracks were taken up and used by the Placerville & Sacramento Valley R. R., between Folsom and Shingle Springs. There are still places where the right of way can be traced out, but they are very few after all these years. At a ghost town called Ashland, across the river from Folsom an old packing shed is all that remains of the road. This was their depot when the town was called Big Gulch.

From here we went up over the grade of what was once the California Central R. R., and which is now used as the county highway. At the top of the hill we passed thru the cut made by the California Central when it was built and which the road now uses just as the railroad left it, except that it is surfaced with a nice smooth road.

The California Central was incorporated in 1857 but track laying was not commenced until a few years later. By 1861 the track was laid as far as Lincoln, from Folsom thru Junction (Roseville) and the company had a right of way graded to Marysville. In 1866 when the Central Pacific reached Junction they bought the California Central, abandoned the line from Junction to Folsom and used the portion between Junction and Marysville as part of their Oregon line, which is still in service.

From Folsom it was only a few miles home, passing thru Orangevale and Fair Oakes, and we arrived safely. We had traveled over 500 miles, been up to 8,000 feet above sea level, thru some of the historic country of the 49ers, on the desert and in the mountains, seen many interesting sights and much historic railroading!

Locomotives of the Boston & Maine Railroad

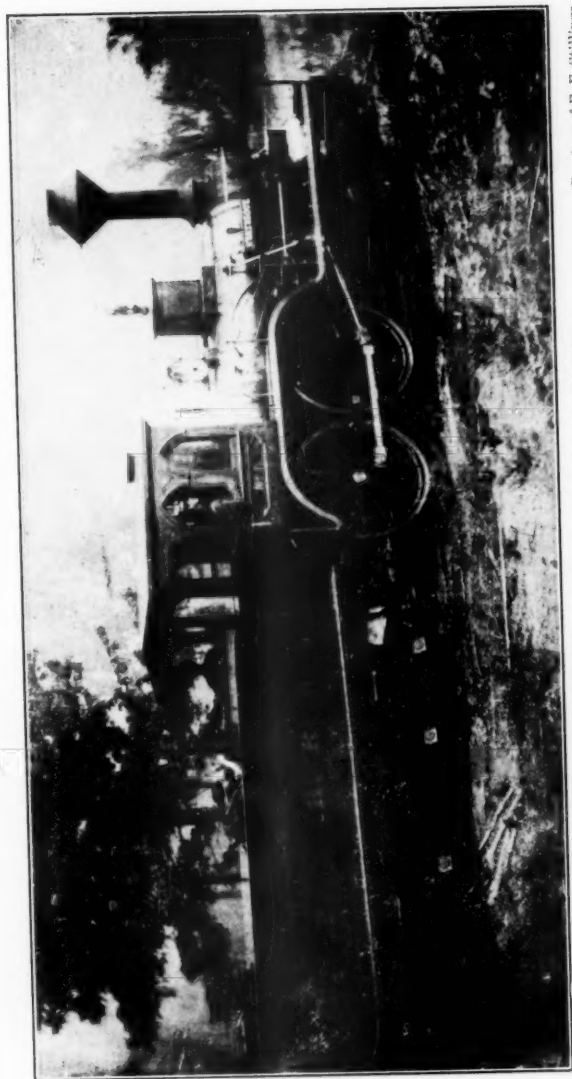
By CHARLES E. FISHER

PORTLAND & ROCHESTER RAILROAD

THE next group of locomotives in the Boston & Maine series came from the Portland & Rochester R. R. This road was originally chartered in the State of Maine, July 30, 1845 as the York & Cumberland R. R. It was opened from Portland to Bar Mills, 19 miles, in February, 1853. On October 4th, 1865, the company was reorganized as the Portland & Rochester R. R., the road extended from Bar Mills to Rochester, New Hampshire, a distance of 35 miles. On January 1, 1900 the road was merged with the Boston & Maine R. R.

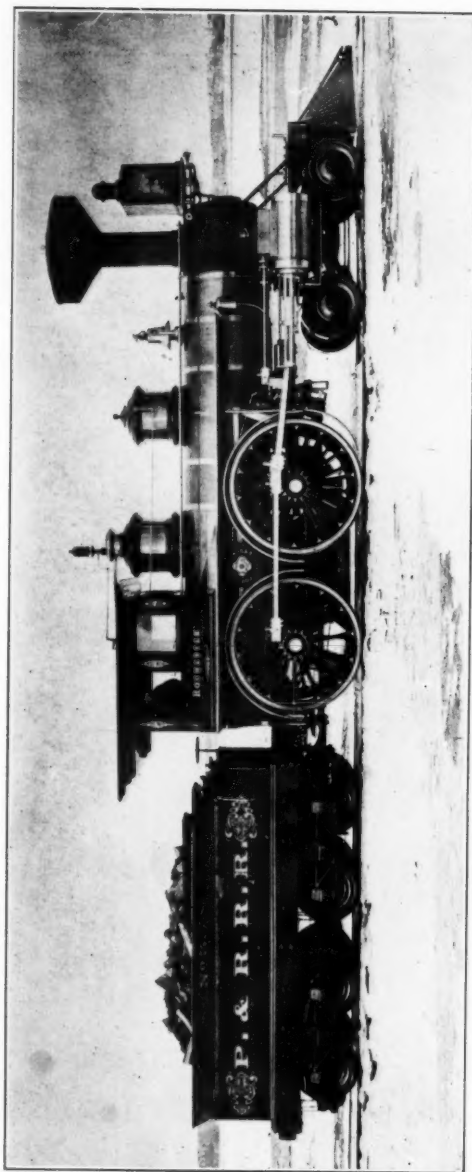
Of the early engines of the York & Cumberland R. R., but little is known. The "Westbrook" furnished by the Portland Works in 1853 was a new engine. Mr. Yeaton states that the "Vermont" was purchased from the Boston & Maine R. R. in 1861. Apparently these are the only two engines owned by the road, prior to the reorganization. The list of Portland & Rochester R. R. locomotives, as presented by Mr. Yeaton, is as follows:

1 Westbrook	Portland	# 47	2-8-53	13x20"	4-4-0	Scrap P & R 1883
1 Presumpscot	Portland	# 539	3-22-86	17x24"	4-4-0	Renumbered
587 Not Named	Rebuilt B & M R R		1900	17x24"	4-4-0	Renumbered 674
2 Vermont	Hinkley & Drury	—	1856	15x20"	4-4-0	Scrap P & R
2 Alfred	Portland	# 358	1-12-80	16x24"	4-4-0	Renumbered
588 Not Named					4-4-0	Scrap B & M 1902
3 Rochester	Portland	# 147	12-5-67	14x22"	4-4-0	Scrap P & R 1894
3 Rochester	Manchester		1895	18x24"	4-6-0	Renumbered
589 Not Named					4-6-0	Renumbered 1922
4 C. Q. Clapp	Portland	# 184	12-19-70	15x24"	4-4-0	Rebuilt & renamed
Massabesic				15x24"	4-4-0	Sold 1900
5 Toppan Robie	Portland	# 199	1871	16x22"	4-4-0	Scrap P & R 1877
5 Toppan Robie	Schenectady	—	1878	16x24"	4-4-0	Rebuilt & renamed
Narragansett			1888	16x24"	4-4-0	Renumbered
590 Not Named					4-4-0	Scrap B & M 1906
6 Worcester	Portland	# 279	4-18-74	16x24"	4-4-0	Renumbered
591 Not Named					4-4-0	Scrap B & M 1903
7 Portland	Portland	# 325	12-12-74	16x24"	4-4-0	Renumbered
592					4-4-0	Scrap B & M 1906
8 Sanford	Portland	# 453	2-13-83	17x24"	4-4-0	Renumbered
593 Not Named					4-4-0	Scrap B & M 1903
9 Sagamore	Portland	# 585	10-20-88	17x24"	4-4-0	Renumbered
594 Not Named					4-4-0	Scrap, B & M 1908
10 Algonquin	Portland	# 608	8-29-90	17x24"	4-4-0	Renumbered
595 Not Named					4-4-0	Renumbered 619
11 Mascot	Rhode Island	—	1891	16x20"		Forney Renumbered
596 Not Named						Forney Renumbered 49
12 Westbrook	Rhode Island	# 2356	1891	16x20"		Forney Renumbered
597 Not Named						Forney Scrap, B & M 1909
13 Onward	Hinkley	# 1739	1887	?	4-2-2	Rebuilt
598 Not Named	Manchester			?	4-4-0	Scrap, B & M 1905
14 Waquoit	Manchester	—	1899	19x26"	4-6-0	Renumbered
599 Not Named					4-6-0	Renumbered 2013



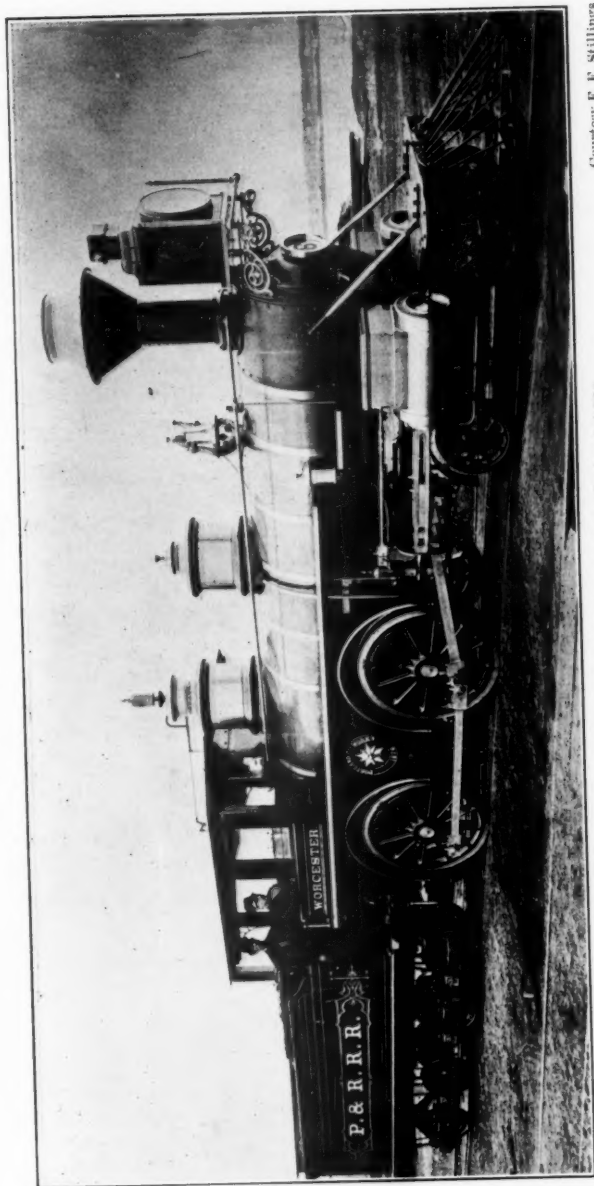
Courtesy of E. F. Stillings

Portland & Rochester R. R. "Westbrook"—Portland, 1853



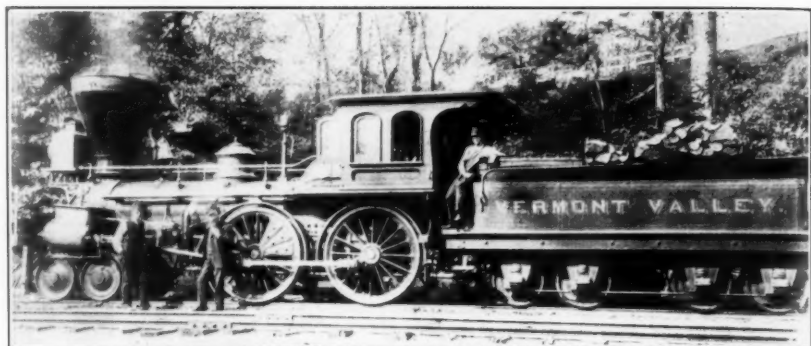
Portland & Rochester R. R. "Rochester"—Portland, 1867

Courtesy E. F. Stillings



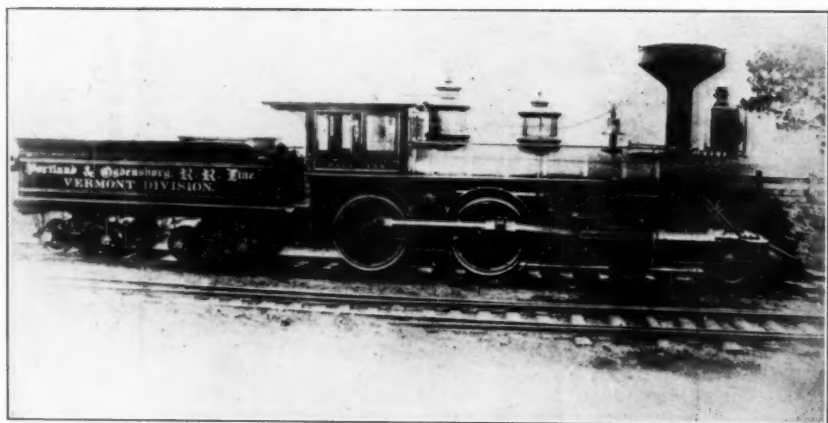
Courtesy E. F. Stillings

Portland & Rochester R. R. "Worcester"—Portland, 1874



Vermont Valley R. R. "Westminster"—R. K. & G.—1851

Courtesy of J. W. Merrill



Portland & Ogdensburg R. R. "Hyde Park"—Portland, 1871

The "Onward" was an experimental locomotive, built for the Swinerton Locomotive Driving Wheel Co. The driving wheels were built with polygonal tires, each tire had 118 sides or flat surfaces of varying lengths. The theory was that the circumference of a circle could touch a straight line at but a small point and that the many sides would secure adhesion to the rails. The experiment was not a success and after a few years service on several roads it was purchased by the Portland & Rochester R. R. It was later built to a 4-4-0 type of engine at the Manchester Works.

SULLIVAN COUNTY R. R.

VERMONT VALLEY R. R.

Until within the last few years, anyone making the journey between Springfield, Massachusetts and White River Jet., Vermont would have ridden behind a locomotive lettered either one of the above companies although otherwise it would have been of the same Boston & Maine standard.

The Sullivan R. R. chartered July 10, 1846, to build a railroad from Bellows Falls to Windsor, Vermont, was opened on Feb. 5, 1849. This road had five locomotives, none of which were ever included in the Boston & Maine series :

Charlestown	Hinkley & Drury			11½x20"	4-4-0	Purchased from
Ascutney	Hinkley & Drury	#228	1-22-49	15x20"	4-4-0	Fitchburg R R
Sunapee	Hinkley & Drury	#224	1-31-49	15x20"	4-4-0	Sold, Northern
Skitchawaug	Hinkley & Drury	#244	8-6-49	16x20"	4-4-0	(N H) R. R.
Claremont	Taunton	#194	1855	15x20"	4-4-0	

In 1851, this twenty-four mile railroad was leased by the Vermont Central R. R. On September 6, 1866, on account of financial troubles, the road was reorganized as the Sullivan County R. R. On October 1, 1880, the Vermont Valley R. R. acquired control and it was through that road that the Connecticut River R. R. operated the Sullivan County. This lasted until Jan. 1, 1893, when the Boston & Maine R. R., leased the Connecticut River R. R. and they in turn operated the road.

The Vermont Valley R. R. was chartered on Nov. 8, 1848, to build a railroad between Brattleboro and Bellows Falls, Vermont. The early engines, which are as follows, so far as we know never came into the Boston & Maine series:

Dummerston	Rogers K & G	#264	6-17-51	14x20"	4-4-0
Putney	Rogers K & G	#267	7-2-51	14x20"	4-4-0
Westminster	Rogers K & G	#276	8-27-51	14x20"	4-4-0
Brattleboro	Rogers K & G	#461	1-31-54	15x20"	4-4-0

The road was opened in 1851. In June, 1865, the Vermont Valley R. R. was leased for a period of ten years to the Rutland R. R. When the latter road was leased to the Central Vermont R. R., the Vermont Valley went with it. In 1877, the Connecticut River R. R., operated the Ver-

mont Valley, control coming to the Boston & Maine R. R. on Jan. 1, 1893 when the Connecticut River R. R. was leased to the Boston & Maine R. R.

	600 Schenectady	—	1904 20x26"	4-6-0 Renumbered 473-2107
	600 Manchester	—	1908 19x28"	4-4-2 Renumbered S C 9—B & M 3240
Ct. R	33 Taunton	# 807	1881 17x24"	4-4-0 Renumbered
	601			4-4-0 Scrap—1904
	601 Manchester	—	1905 19x26"	2-6-0 Renumbered S C 5—B & M 1409
Ct. R	28 Rogers	# 2766	1881 17x24"	4-4-0 Renumbered
	602			4-4-0 Sold to Milford Pink Granite Co., 1902
B & M	908 Manchester	# 1755	1900 18x24"	4-4-0 Renumbered 602
	602			4-4-0 Renumbered S C 2—B & M 988
Ct. R	29 Schenectady	# 1373	1881 17x24"	4-4-0 Renumbered
	603			4-4-0 Renumbered S C 6—Scrap 1904
S C	6 Manchester	—	1905 19x26"	2-6-0 Renumbered B & M 1408
Ct. R	38 Schenectady	# 1626	1882 17x24"	4-4-0 Renumbered
	604			4-4-0 Sold—1905
	604 Manchester	—	1906 19x26"	2-6-0 Renumbered S C 7—B & M 1419
Ct. R	27 Rogers	# 2765	1881 17x24"	4-4-0 Renumbered
	605			4-4-0 Scrap—B & M 1899
B & M	902 Manchester	—	1900 18x24"	4-4-0 Renumbered
	605			4-4-0 Renumbered S C 3—B & M 985
Ct. R	26 Taunton	# 781	1881 17x24"	4-4-0 Renumbered
	606	Sold and under No. 257 was one of the engines took part in the 4th of July collision staged at Point of Pines, Revere, Mass.		
	606 Manchester	—	1903 19x26"	2-6-0 Renumbered S C 4—B & M 1379
Ct. R	25 Taunton	# 780	1881 17x24"	4-4-0 Renumbered
	607			4-4-0 Scrap—1906
	607 Manchester	—	1907 19x26"	2-6-0 Renumbered S C 8—B & M 1449
Ct. R	41 Schenectady	# 1721	1883 17x24"	4-4-0 Renumbered
	608			4-4-0 Scrap 1908
	608 Manchester	—	1909 19x26"	4-4-2 Renumbered S C 10—B & M 3244
Ct. R	31 Rhode Island	—	1869 16x24"	4-4-0 Renumbered
	609			4-4-0 Sold—Dec. 12, 1895
Ct. R	9 Schenectady	—	1890 18x24"	4-4-0 Renumbered 547-609
	609			4-4-0 Renumbered S C 1—Scrap B & M
	610 Manchester	—	1908 19x28"	4-4-2 Renumbered V V 29—B & M 3241
V V	8 Schenectady	# 2252	1887 17x24"	4-4-0 Renumbered
	611			4-4-0 Scrap—B & M 1905
B & M	685 Manchester	—	1906 19x26"	2-6-0 Renumbered
	611			2-6-0 Renumbered V V 27—B & M 1418
V V	52 Schenectady	# 3313	1890 18x24"	4-4-0 Renumbered
	612			4-4-0 Scrap—B & M
B & M	3231 Manchester	—	1909 19x26"	4-4-2 Renumbered V V 21—B & M 3231
V V	6 Schenectady	# 1881	1884 17x24"	4-4-0 Renumbered
	613			4-4-0 Scrap—B & M 1905

B & M	643 Manchester 613	—	1906 19x26"	2-6-0 Renumbered 2-6-0 Renumbered V V 28—B & M 1431
V V	5 Taunton	# 677	1877 16x24"	4-4-0 Originally named "Hugh Henry" Renumbered
B & M	614 Sold in 1902 to either Bath Lumber Co. or Clinton Coal Co. 903 Manchester 614	#1753	1900 18x24"	4-4-0 Renumbered 4-4-0 Renumbered V V 25—B & M 986
V V	7 Schenectady 615 Rebuilt in	#2145	1886 17x24" 1904 17x24"	4-4-0 Renumbered 4-4-0 Renumbered V V 20—Scrap B & M
V V	51 Schenectady 616	#3312	1890 18x24"	4-4-0 Renumbered 4-4-0 Renumbered V V 22—Scrap B & M
B & M	459 Manchester 617	—	1891 18x24"	4-4-0 Renumbered 4-4-0 Scrap—B & M
B & M	3648 Schenectady	—	1911 22x28"	4-6-2 Renumbered V V 23—B & M 3648
B & M	460 Manchester 618	—	1891 18x24"	4-4-0 Renumbered 4-4-0 Renumbered V V 24—Scrap B & M
B & M	637 Manchester 619	#1737	1900 18x24"	4-4-0 Renumbered 4-4-0 Renumbered V V 26—B & M 957-987
B & M	851 Manchester 620	—	1909 19x28"	4-4-2 Renumbered 4-4-2 Renumbered V V 30—B & M 3243

Ct. R = Connecticut River R. R.

S.C. = Sullivan County R. R.

V V = Vermont Valley R. R.

B & M = Boston & Maine R. R.

ST. JOHNSBURY & LAKE CHAMPLAIN R. R.

This road was formerly the Vermont Division of the Portland & Ogdenburg R. R. When the latter road was reorganized on July 1, 1880, the St. Johnsbury & Lake Champlain R. R. was formed. On April 1, 1885, the road was leased to the Boston & Lowell R. R. for 99 years but was surrendered in 1887. It operated independently until leased by the Boston & Maine R. R. in 1895.

At the time the road was leased to the Boston & Lowell R. R., the road owned 15 locomotives. These engines were included in the Boston & Lowell series, but upon return to the former owners, the St. J. & L. C. R. R. started a new series.

1	St. Johnsbury	Portland	# 190	1871 14x22"	4-4-0 B & L #153 Sold—1888
2	Lamoille Lyndonville	Portland	# 196	1871 15x24"	4-4-0 B & L #154. Renamed 4-4-0 Scrap—1888
3	Swanton	Portland	# 204	1871 14x22"	4-4-0 B & L #155 4-4-0 Renumbered 4-4-0 Sold—1896
621	1				
4	Hyde Park	Portland	# 202	1871 15x24"	4-4-0 B & L #156 4-4-0 Renumbered 4-4-0 Scrap—B & M 1896
622	2				
5	Essex	Portland	# 207	1871 14x22"	4-4-0 B & L #157. Renamed

	Danville				4-4-0 Scrap—1888
6	Maquam	Taunton	# 593	1872 16x24"	4-4-0 B & L #158
3					4-4-0 Renumbered
623					4-4-0 Sold—1894
7	Mansfield	Taunton	# 595	1872 16x24"	4-4-0 Renamed
	Gov. Fairbanks				4-4-0 B & L #159
4					4-4-0 Renamed
624	Mansfield				4-4-0 Scrap—B & M 1897
8	Champlain	Portland	# 373	1881 16x24"	4-4-0 B & L #160
5					4-4-0 Renumbered
625					4-4-0 Scrap—B & M 1895
9	Caledonia	Portland	# 389	1881 17x24"	4-4-0 B & L #161
6					4-4-0 Renumbered
626					4-4-0 Scrap—B & M 1896
10	Franklin	Portland	# 390	1881 17x24"	4-4-0 Renamed
	Fairfield				4-4-0 B & L #162
7					4-4-0 Renumbered
627					4-4-0 Scrap—B & M 1902
11	Col. Jewett	Rogers	#2308	1873 17x24"	4-4-0 Renamed
	Highgate				4-4-0 Renamed
	Col. Jewett				4-4-0 B & L #163
8					4-4-0 Renamed
628	Highgate				4-4-0 Scrap—B & M 1902
12	Col. Fairbanks	Rogers	#2310	1873 17x24"	4-4-0 B & L #164
9					4-4-0 Renumbered
629					4-4-0 Scrap—B & M 1907
13	A. B. Harris	Schenectady	#1853	1884 17x24"	4-4-0 B & L #165
10					4-4-0 Renumbered
630					4-4-0 Renumbered 668
630	Formerly #852	Manchester		1909 19x28"	4-4-2 Renumbered S C 11
					B & M 3242
14	Gov. Hendee	Schenectady	#1854	1884 17x24"	4-4-0 Renamed
	Morrisville				4-4-0 Renamed
	Gov. Hendee				4-4-0 B & L #166
11	Morrisville				4-4-0 Renumbered
631					4-4-0 Renumbered 669
631		Manchester		1908 19x24"	0-6-0 Renumbered 269
15	Plattsburg	Schenectady	#1855	1884 17x24"	4-4-0 B & L #167
12					4-4-0 Renumbered
632					4-4-0 Scrap—B & M 1907

The engines "St. Johnsbury", "Lamoille", "Swanton", "Hyde Park" and "Essex" were built for the Portland & Ogdensburg R. R. When the Vermont Division was reorganized on July 1, 1880, as the St. Johnsbury & Lake Champlain R. R., these engines became their property and were numbered 1, 2, 3, 4 and 5 respectively, the same names being retained.

Nos. 6 and 7 were originally built for Messrs. P. E. Gay and C. H. Brigham. In default of payment, the Taunton Locomotive Works sold them to the Portland & Ogdensburg R. R., and they, like the first five engines, came to the St. Johnsbury & Lake Champlain R. R.

Nos. 11 and 12 were originally built for the Indiana, Bloomington & Western Ry. They were subsequently returned to the Rogers Works, rebuilt and sold to the Housatonic R. R. where they were numbered 21 and 22. They were again sold by the Housatonic R. R. to the Massachusetts Central R. R. where they were numbered 1 and 2. When the latter road was controlled by the Boston & Lowell R. R., they sold them to the St. Johnsbury & Lake Champlain R. R.

The following engines were ordered by the Boston & Maine R. R.

633	Not	Named	Manchester		1900	18x24"	4-4-0	Renumbered	950
634	Not	Named	Manchester		1900	18x24"	4-4-0	Renumbered	951
635	Not	Named	Manchester		1900	18x24"	4-4-0	Renumbered	952
636	Not	Named	Manchester		1900	18x24"	4-4-0	Renumbered	953
637	Not	Named	Manchester		1900	18x24"	4-4-0	Renumbered	V V 26
									—B & M 957
638	Not	Named	Manchester		1900	18x24"	4-4-0	Renumbered	954
639	Not	Named	Manchester		1900	18x24"	4-4-0	Renumbered	955
640	Not	Named	Manchester		1900	18x24"	4-4-0	Renumbered	956
641	Not	Named	Baldwin	#21680	1903	18x24"	4-4-0	Renumbered	961
642	Not	Named	Baldwin	#21687	1903	18x24"	4-4-0	Renumbered	962
643	Not	Named	Baldwin	#21694	1903	18x24"	4-4-0	Renumbered	963
644	Not	Named	Baldwin	#21705	1903	18x24"	4-4-0	Renumbered	964
645	Not	Named	Baldwin	#21710	1903	18x24"	4-4-0	Renumbered	965
646	Not	Named	Manchester	#28226	1903	19x26"	2-6-0	Renumbered	1364
647	Not	Named	Manchester	#28227	1903	19x26"	2-6-0	Renumbered	1365
648	Not	Named	Manchester	#28228	1903	19x26"	2-6-0	Renumbered	1366
649	Not	Named	Manchester	#28229	1903	19x26"	2-6-0	Renumbered	1367
650	Not	Named	Manchester	#28230	1903	19x26"	2-6-0	Renumbered	1368
651	Not	Named	Manchester	#28231	1903	19x26"	2-6-0	Renumbered	1369
652	Not	Named	Manchester	#28232	1903	19x26"	2-6-0	Renumbered	1370
653	Not	Named	Manchester	#28616	1903	19x26"	2-6-0	Renumbered	1380
654	Not	Named	Manchester	#28617	1903	19x26"	2-6-0	Renumbered	1381
655	Not	Named	Manchester	#28618	1903	19x26"	2-6-0	Renumbered	1382
656	Not	Named	Manchester	#28619	1903	19x26"	2-6-0	Renumbered	1383
657	Not	Named	Manchester	#28620	1903	19x26"	2-6-0	Renumbered	1384
658	Not	Named	Manchester	#28621	1903	19x26"	2-6-0	Renumbered	1385
659	Not	Named	Manchester	#28622	1903	19x26"	2-6-0	Renumbered	1386
660	Not	Named	Manchester	#28623	1903	19x26"	2-6-0	Renumbered	1387
661	Not	Named	Manchester	#28624	1903	19x26"	2-6-0	Renumbered	1388
662	Not	Named	Manchester	#28625	1903	19x26"	2-6-0	Renumbered	1389
663	Not	Named	Manchester	#28630	1903	19x24"	0-6-0	Renumbered	204
664	Not	Named	Manchester	#28631	1903	19x24"	0-6-0	Renumbered	205
665	Not	Named	Manchester	#28632	1903	19x24"	0-6-0	Renumbered	206
666	Not	Named	Manchester	#28633	1903	19x24"	0-6-0	Renumbered	207
667	Not	Named	Manchester	#28634	1903	19x24"	0-6-0	Renumbered	208
668	Not	Named	Schenectady	# 1853	1884	17x24"	4-4-0	St. J. & L. C. #10—	
									B & M 630
									Scrap—B & M 1909
669	Not	Named	Schenectady	# 1854	1884	17x24"	4-4-0	St. J & L C #11—	
									B & M 631
									Scrap—B & M 1909
670	Not	Named	Manchester	#29842	1904	19x26"	2-6-0	Renumbered	1392
671	Not	Named	Manchester	#29843	1904	19x26"	2-6-0	Renumbered	1393
672	Not	Named	Manchester	#29844	1904	19x26"	2-6-0	Renumbered	1394
673	Not	Named	Manchester	#29845	1904	19x26"	2-6-0	Renumbered	1395
674	Not	Named	Manchester	#29846	1904	19x26"	2-6-0	Renumbered	1396
675	Not	Named	Manchester	#29847	1904	19x26"	2-6-0	Renumbered	1397
676	Not	Named	Manchester	#29848	1904	19x26"	2-6-0	Renumbered	1398
677	Not	Named	Manchester	#29849	1904	19x26"	2-6-0	Renumbered	1399
678	Not	Named	Manchester	#38981	1906	19x26"	2-6-0	Renumbered	1410
679	Not	Named	Manchester	#38982	1906	19x26"	2-6-0	Renumbered	1411
680	Not	Named	Manchester	#38983	1906	19x26"	2-6-0	Renumbered	1412
681	Not	Named	Manchester	#38984	1906	19x26"	2-6-0	Renumbered	1413
682	Not	Named	Manchester	#38985	1906	19x26"	2-6-0	Renumbered	1414
683	Not	Named	Manchester	#38986	1906	19x26"	2-6-0	Renumbered	1415
684	Not	Named	Manchester	#38987	1906	19x26"	2-6-0	Renumbered	1416
685	Not	Named	Manchester	#38988	1906	19x26"	2-6-0	Renumbered	V V 27
									—B & M 1418

686	Not Named	Manchester	#38989	1906	19x26"	2-6-0	Renumbered	1417
687	Not Named	Manchester	#42821	1907	19x26"	2-6-0	Renumbered	1435
688	Not Named	Manchester	#42822	1907	19x26"	2-6-0	Renumbered	1436
689	Not Named	Manchester	#42823	1907	19x26"	2-6-0	Renumbered	1437
690	Not Named	Manchester	#42824	1907	19x26"	2-6-0	Renumbered	1438
691	Not Named	Manchester	#42825	1907	19x26"	2-6-0	Renumbered	1439
692	Not Named	Manchester	#42826	1907	19x26"	2-6-0	Renumbered	1440
693	Not Named	Manchester	#42827	1907	19x26"	2-6-0	Renumbered	1441
694	Not Named	Manchester	#42828	1907	19x26"	2-6-0	Renumbered	1442
695	Not Named	Manchester	#42829	1907	19x26"	2-6-0	Renumbered	1443
696	Not Named	Manchester	#42830	1907	19x26"	2-6-0	Renumbered	1444
697	Not Named	Manchester	#42831	1907	19x26"	2-6-0	Renumbered	1445
698	Not Named	Manchester	#42832	1907	19x26"	2-6-0	Renumbered	1446
699	Not Named	Manchester	#42833	1907	19x26"	2-6-0	Renumbered	1447

The next group of locomotives in the Boston & Maine series came from the Concord & Montreal R. R. and they will appear in our next contribution.

Mr. G. F. Starbuck has called my attention to an error which appeared in Bulletin No. 32 in connection with the locomotives from the Connecticut River R. R. The 2nd No. 8 "Deerfield" instead of being built by the road, was built by Rogers, builder's No. 2528, in 1879 and was cut up at the Concord Shops in 1901. Also, Connecticut & Passumpsic Rivers R. R. "Albert Knight" #19, never carried B & M #432. Mr. Starbuck states that as late as 1903 it was still stored at St. Johnsbury and still carried its #19 and had its wood burner stack. Subsequently it was sold to some saw mill in Maine and was scrapped in service there.

Turning now to the Boston & Lowell R. R. locomotives, Mr. Starbuck has been kind enough to permit the writer to examine an appraisal made of their motive power on April 1, 1887. From this we learn the following:

B & L #11 "Muzzey", Boston L. W. 1852, rebuilt B. L. & N. R. R. 1869, must have been renamed "Titania". The "Titania" appears as #11 on this appraisal, the valuation is placed at \$500.00 and the dimensions are the same as the "Muzzey". The "Nashua", Mason, 1866, is numbered 55, but upon the arrival of the "Colossus", Rhode Island, 1887, the "Colossus" was assigned #55 and the "Nashua" was evidently assigned #11. The "Boardman" #70, Mason, 1857, on the list of 1884, appears as the "Hudson" #70, on this appraisal, with the note—"now Boardman". It is the same engine and evidently carried the name "Hudson" some time during the years 1884-1887.

In connection with the "Stephenson", the first locomotive on the Boston & Lowell R. R., the following notes in connection with this locomotive were received from our member—Mr. F. Gaiser:

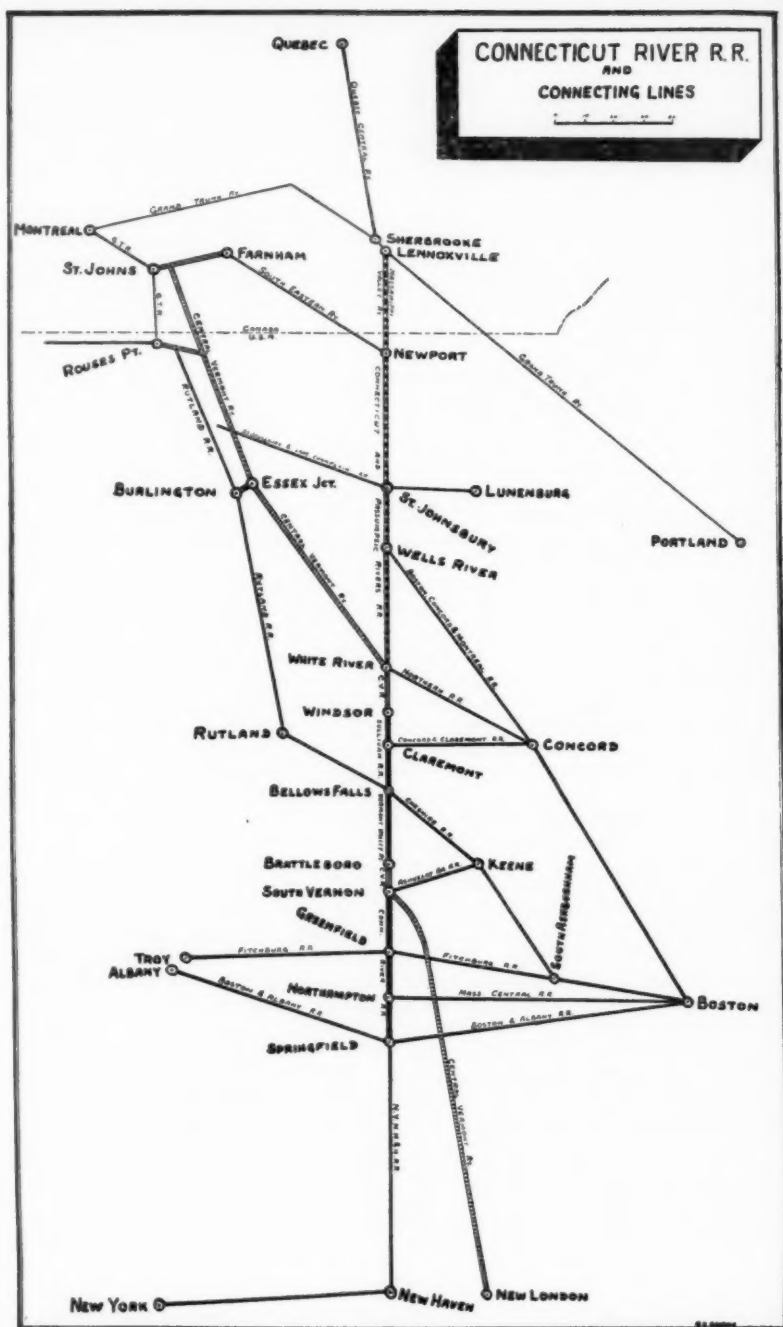
"In the matter of the first locomotive of the Boston & Lowell R. R., the 'Stephenson', (Bulletin No. 32, pages 39-41), I beg to draw the attention of our readers to the following items:

"From the notice (E. U.), given by Mr. Dendy Marshall with regard to the 'Stephenson', it appears that his principal authority for this engine was *The Engineer*—Part II, of the series of articles—'Locomo-

tives supplied by British firms to American Railroads' for June 28, 1898. Here we not only find a detailed description of the 'Stephenson', but also a sketch of it and this sketch shows a very short wheel base, the wheels being as close together as possible. In the description the wheels are given as 5 ft. in diameter and the wheel base as 5'-3", the total length of frames from outside of buffer beam to outside back plate being said to have been 16 feet. Other dimensions: cylinders 12x16" boiler barrel 7'-1½" long, tubes—97 in number, 7'-4½" long and 1⅝" diameter, smoke box and fire box casing measuring in length 1'-10½" and 2'-7" respectively. No mention is made of this engine in the books of Wood and Whishaw. On account of this, some dimensions such as wheel base and length of smoke box and outer firebox are those which never figured in the lists of the two authors, it must be deducted that the dimensions as well as the sketch came directly from Stephenson & Co. and that some dimensions were entered in the sketch.

"It is known from Warren's Stephenson book that many of the earlier working drawings of Stephenson & Co. were incomplete as to boiler mountings and certain other details (Warren page 254 upper drawing, pages 255, 257, 265, 272, 280 middle drawing). In other drawings the steam dome and manhole are shown, but in almost none will the lock-up safety valve be found. We know, however, from other sources and from a few more complete Stephenson drawings, what these details were like. The steam dome increased in height and size as time progressed (compare the 'Planet' with the drawings on page 300, the 'Patentee' on page 310 and the Russian engine on page 322) and reached a comparatively massive form in the engines represented on page 340. In the earlier engines the manhole was situated on the boiler barrel and in the later ones on the firebox. As to the casing of the lock-up safety valve, this changed several times, until from 1834, at the latest, to the end of 1836, it had invariably taken the well known form as shown in the two Harvey Combes, the genuine as well as the false; that is it was swelled below and opened above into a waste-pipe of moderate height. In 1837 the candelabrum form appeared, the two valves either being behind the dome as in the 'Victorieuse' or taking the steam dome between as in the celebrated 'North Star' for the Great Western Ry. From the foregoing one will appreciate the difficulty to give the proper details to the drawing of a locomotive built between 1830 and 1837. The writer of the article in *The Engineer*, whom we may call Mr. X, avoided the difficulty by invariably using the same shapes of steam dome and of valve casing and was quite unconcerned as to the time the engine was built. It is quite amusing for those acquainted with the varieties of evolution to see the Stephenson of 1832 adorned with a safety valve cover unknown at the time or the 'Baltimore' (recte 'Chieftain') of the Baltimore & Susquehanna R. R. (1837) with two valve covers of the same swelled type, although this had already been followed by the candelabrum pattern.

"The picture in Bulletin No. 31—'Locomotive Stephenson and first train on the Boston & Lowell R. R.' shows, curiously enough, no Planet or Samson at all, but a Northumbrian—a type of engine of which as yet only two samples were known; the 'Northumbrian' itself, August,



1830 and the 'Majestic', (November, 1830). Both engines went to the Liverpool & Manchester R. R. The Northumbrian was the latest descendant of the Rocket family and quite opposite to the Planet (October, 1830), by which it was immediately followed. It had *outside*, slightly sloping cylinders, placed at the sides of the firebox and working on to the leading wheels, the carrying wheels, which were smaller in diameter, being placed beneath the footplate. These details can be clearly seen in the picture, save that the connecting rod is too steeply inclined and ends on the circumference of the driving wheel, near the rail, instead of at the boss. The carrying wheel is pushed forward under the firebox, an item very common with artistic reproductions, the artist aiming instinctively at a symmetrical distribution of the axles. The too high pitching of the boiler is also suggested by artistic consideration—to symbolize the great power of the engine by an imposing appearance. The boiler mountings are ranged in the picture as follows: manhole cover, lock-up safety valve casing, and upon the firebox, a low dome. This is in the same order as in the 'Northumbrian' (see Warren, page 243) and the form of the mountings is also the same. There is, moreover, in both instances, the same balustrade in the form of a quadrant with radii and the same tender.

"The 'Stephenson' of the Boston & Lowell R. R., from the data given by Mr. X, is very unlikely to have been of the Northumbrian type. It is, however, *not impossible*, that such was the case. Suppose we forget *The Engineer* and Mr. X and ask—How has the artist proceeded in outlining the engine? Has he had a drawing, a copy before him or did he sketch it from observation? We believe the latter, because the whole train, the carriages filled with people and loaded with luggage, as well as the engine with engineer and stoker, made a very natural and vivid impression. We must also bear in mind that the drawings of the 'Northumbrian', then available (Warren Pages 238, 240, 243, 244) are wholly different in conception and style from the picture in question. Moreover, if the artist had used one of these drawings, he would certainly not have made the mistake concerning the inclination of the cylinder and connecting rod.

"Our supposition is in no way incompatible with those authorities which refer to the 'Stephenson'; for they assert only that the 'Stephenson' was different from the Locks & Canals Co. engines and that the latter were built to conform with the Planet type. No one has stated that the 'Stephenson' served as a model for this purpose. In 1834, there were two other engines in Boston which could serve as models for the Locks & Canals Co. One was the 'Whistler', originally the property of the Boston & Lowell R. R., which had been sold to the Boston & Providence R. R. in 1833. The other was the 'Meteor' of the Boston & Worcester R. R. The long life of the 'Stephenson', attested by the letter of Mr. P. T. Jackson in Bulletin 4, page 45, witnesses rather for the Northumbrian than for the Planet type. The former was much more capable of resisting hard service than the fragile and complicated Planet pattern. It would have been almost impossible for a Planet engine to remain five years in service without a general overhauling and repairs as this is stated for the 'Stephenson' in this same letter from Mr. P. T. Jackson.

"The word *like* mentioned on Page 40, Bulletin 32, does not mean the complete likeness of the two engines. It may refer to wheel arrangement in as much as both engines were of the four-wheel uncoupled type. We also know from the earlier locomotive literature, such as the books of Pambour or Whishaw that *like* or *similar* were used in a much broader meaning than present day usage.

"Mr. X. has erroneously thought that the Boston & Providence R. R. "Whistler" was the engine ordered in 1828 by Captain Whistler in person and shipped in 1829. It is now known that this engine was destined for the Baltimore & Ohio R. R. and that it was lost at sea (Mr. Warren in *The Locomotive*, 1932, page 341). The Boston & Providence R. R. 'Whistler', which was, according to the U. S. A. Document of 1838, put to work in 1833, cannot but be, in my opinion, Mr. X's 'Stephenson', and all Mr. X states about the 'Stephenson' must in reality be valid for the 'Whistler'. As for the Boston & Worcester R. R. engine, Mr. X describes the 'Boston' as a 2-2-0 Planet type engine. This locomotive, according to Mr. X, was ordered in the same year as the 'Meteor', the first engine of the Boston & Worcester R. R. was built—in 1831. However, the 'Meteor' was originally built for the Baltimore & Susquehanna R. R., the 'Boston' was, all the same, the first engine ordered by the Boston & Worcester R. R. As for the name, it was certainly borrowed from the designation of the railway, the real name not being known to the writer. (We observe the same proceeding with regard to the engines 'Stephenson' #151 and 152 for the Baltimore & Susquehanna R. R., which Mr. X calls 'Baltimore' and 'Susquehanna', whereas the actual names were 'Chieftain' and 'Sampson' from the very outset). Now this 'Boston' or its equal, cannot be traced in either the Document of 1838 or in the 'Locomotive Performance', published in Bulletin 23, pages 9-21. It is not impossible to suppose the 'Boston' to be identical with the very 'Stephenson' (Northumbrian type) of the Boston & Lowell R. R., in which case Mr. X's description of the 'Boston' as a Planet type would be wrong. This however, would not be the only error in Mr. X's articles.

"As no such engine as a third locomotive of the Northumbrian type or as Mr. X's 'Boston' can be found in the lists of Wood or Whishaw, we might conclude that the 'Northumbrian' or 'Majestic' (Liverpool & Manchester Ry.) were sold to the Boston & Lowell R. R. prior to June, 1835, were it not for the entry in Dendy Marshall's Liverpool & Manchester book—"done with by 1836." Here I will leave this very interesting question with the hope that other members will contribute their own researches and results.

"As for the two engines furnished by Rothwell to the Bangor & Piscataquis R. R., only the second, No. 6, was constructed from Stephenson's drawings. The No. 4 embodied what we may call—Rothwell's original locomotive pattern. It will be seen from Fig. 16 in Ahron's—"British Steam Railway Locomotives", that this engine, the 'Pioneer', had a circular firebox, inside sandwich frames and valve chests on the inner sides of the cylinders. This latter arrangement purported no less than the direct motion (already in 1832), the indirect motion being confined to the few moments when hand gearing was required. This type

of engine surpassed the 'Patentee' in simplicity of framing and even the otherwise simple Bury engine by its direct motion. It was the most simple and yet the most solid locomotive of its time.

"The No. 6—Bangor—was probably built in 1834 (Whishaw), not in 1836 (U. S. A. Document and Mr. X), for there was no longer any necessity of hand gearing after the two loose eccentrics had been, early in 1836, followed by two and, shortly afterwards, four fixed eccentrics, save in a few instances where hand gearing was expressly ordered.

"In the matter of one or two hand gearing ties, it must be distinguished between Stephenson & Co. and others. Stephenson and his followers (Tayleur and Longridge) kept to the double tie until 1834. There are engines of 1834 with double ties and such of the same year with a single tie on each side only, and if Ahrons' dates on page 24 of his book are correct, two 0-4-2 engines of Stephenson, delivered in December, 1833, were already fitted in the latter style. Other builders, Bury and Rothwell, applied single ties from the outset, utter simplicity being the motto of these builders. Bury, however, went further than Rothwell. Whilst the latter adopted from Stephenson the transverse swinging shaft behind the firebox, Bury transferred the handles to the one, the driver's side of the firebox and articulated each of them directly with its tie, thus preventing the engine-men, especially the fireman, from being disturbed by the handles going to and fro while the engine was running."

(We certainly appreciate the care with which our member, Mr. Gaiser, has prepared these notes. They have been the means of adding no little information relative to the "Stephenson" on the Boston & Lowell R. R. and giving us something to reflect upon.)

Brief Sojourns

By ANN ARBOR



SHORT time ago I received a letter from one of the readers of the bulletin raising the question of my making trips from Ann Arbor when there was so much of interest at home. He also expressed the wish that I make mention of the Michigan Central and the Ann Arbor R. R. in some future contribution.

Ann Arbor is thirty-six miles west of Detroit on the Michigan Central R. R. It used to be nearer thirty-eight miles when the trains went into the old M. C. Station in Detroit. The road followed a fairly straight course until it came to the Huron River and through Ypsilanti and Ann Arbor as far west as Chelsea, it followed the twistings and turnings of that stream. In some places the line of the old railroad, built under State control, could be seen. In spite of this curvature the Michigan Central trains went along at no mean rate of speed.

One thing that always struck me as odd was the number of students that frequented the Michigan Central tracks on a pleasant Sunday afternoon between the station and the water works. Just why the boys and some of the co-eds too, had to select the Michigan Central tracks for a promenade, I have yet to learn. Another item that stands out clearly in my memory were the big blue-backed timetables issued by the Michigan Central. These not only showed the schedules on that road but connecting lines as well. It also indicated the return movement of Pullman equipment, an item not often given in any time table.

At the time I have in mind, the Michigan Central R. R. was not operating through trains in connection with the Canadian Pacific R. R. Perhaps there was less incentive to visit Canada then than there has been during the last decade. Nor was there any "Twilight Limited" or "Motor City Special." Yet the service, supplemented by the "Limiteds" of the Detroit United was good to Detroit and return and to points as far west as Kalamazoo.

The first usable train eastward in the morning was the "Atlantic Express", due at Ann Arbor at 6:57 A. M. The name was a misnomer because it left Chicago the preceding evening and after making nearly all the stops it arrived in Buffalo the next afternoon. It did serve the local stations however. The next eastbound train was #46 which arrived at 9:30 A. M. This train left Chicago at midnight and carried a solitary sleeper, arriving at Detroit at 10:30 A. M., the terminus of the run. The next arrival was the crack train of the road—the "Wolverine", due at 2:37 P. M. This train was usually very heavy, a section from Grand Rapids was added at Jackson and was made up with the Chicago coaches sandwiched between the club car and sleepers with the Grand Rapids coaches and chair car on the rear. The train was usually double-headed, and, I'm told that among the students, quarters often exchanged ownership upon the promptness of the arrival of this train. The whistling of this train was magnificent to those who enjoyed such things! No. 10, the "Boston Special" was due at 4:50 P. M. and somewhere on the



The "Wolverine," Eastbound, Leaving Ann Arbor.



M. C. 8466 on Train #46 at Ann Arbor.



M. C. 8458 on Detroit-Grand Rapids Extra, Near Ann Arbor.



M. C. 8474 on Westbound American Express, Near Ann Arbor.

schedule, between these trains ran No. 2, a Chicago-Detroit local. Around 8:30 P. M. came a train from Grand Rapids to Detroit, then at 9:33 P. M. came the "Niagara Falls Express" and around 11:30 P. M. came the "Michigan Central Limited"—now the "Exposition Flyer." There were doubtless solid trains of express matter run, but I did not see them.

For west bound service, the "New York Wolverine" arrived a little after 8:00 A. M., all Pullmans, and the "New England Wolverine" arrived a little after 9:00 A. M. Both trains were very heavy. Then there was a Detroit-Chicago local run somewhere between the two. Around 1:15 P. M. an American Express train used to hike through Ann Arbor at about a sixty mile an hour clip and was followed by a similar job at 1:57 P. M. that did stop. This may have followed a Detroit-Grand Rapids passenger train that came around this time. The next one was the 2:33 P. M. for Chicago and then there was another Detroit-Grand Rapids job around supper time. Two more trains out of Detroit, one leaving at 9:30 P. M. and the "newspaper train" for those who wanted an evening enjoyment in Detroit, leaving at 11:30 P. M. completed the schedule. Both were due at Ann Arbor in about one hour after their departure from Detroit.

At the time I have in mind, the handsome ten wheel passenger engines had gone from main line service and had been supplanted by the Pacific type of engine. The ten-wheelers, retaining much of their good looks, could be found on the runs up in the "Thumb District" of Michigan and on the branch lines. Atlantic type engines, lettered "C. S. Div." would be found in service between Detroit and Toledo, but there were only ten of these engines in service on the road. There were some, not assigned to the Canada Southern Division, that came through Ann Arbor on the Detroit-Grand Rapids runs.

Practically all of the through trains between Detroit and Chicago were handled by the Pacific type of engine. They were run between Detroit and Jackson, where another engine took them as far as Kalamazoo and a third into Chicago. The road received four of these engines in 1904 from the Schenectady Works. Two of them, later to be renumbered 8410 and 8411 were assigned to the Canada Southern Div. between Windsor and Buffalo, the other two, renumbered 8450 and 8451 were used west of Detroit. Subsequent orders of these engines came from the Montreal plant of the American Locomotive Co. They were all 22x26" cylinder, 75" drivers engines. The heaviest of the lot, Nos. 8419-8429 were delivered during 1909-1910 and weighed 154500 lbs. on the drivers. These engines were exceedingly smart, all of those engines on the Canada Southern Div. could travel, and on this section of the road with its long tangents they could be depended upon to make up any reasonable amount of time lost west of Detroit or in the transfer of cars across the Detroit River. Engines and crews were changed at St. Thomas and there were nearly thirty of these engines in service between Windsor and Buffalo.

The engines used west of Detroit were similar, save that they came from the Schenectady plant of the American Locomotive Co. I find a notation that Nos. 8450 and 8453 carried 21x26" cylinders. Whether they were originally equipped with a 22x26" cylinder and the road made

the change, I do not know. So far as cylinders, drivers and weights, they were closely similar to those on the Canada Southern Division. There were about forty of these Pacific type engines in service between Detroit and Chicago. It was not until 1913 that the first K-3 engines, the same class as used on the New York Central, arrived on the Michigan Central R. R.

So far as freight locomotives were concerned, everything used between Detroit and Chicago was of the consolidation type. The way freight, between Detroit and Jackson, generally had one of the old ten-wheel freight engines on the head end. I was very much amused at the race mentioned in Mr. Larmour's article in Bulletin No. 31 between the Grand Trunk and the Michigan Central relative to the prompt movement of hogs. I know that there were plenty of hog trains moved over the Michigan Central from the pungent aroma which settled in the vicinity of the M. C. tracks after the passing of one of those trains.

In the matter of passenger fares, after the passing of the 2c per mile law in the State of Michigan, week end trips, good on any train could be made between Ann Arbor and Detroit for \$1.00. The regular one way fare was 76c. On Sundays, on certain designated trains, a round trip ticket to Detroit could be procured for 60c. The Detroit United (Electric) Ry. would carry you down and back for 90c but no lover of the locomotive or the smell of soft coal smoke would ever ride on the trolley unless the time of day did not afford train service.

Through the kindness of your Editor I have been permitted to illustrate these remarks with some of his pictures, taken in the vicinity of Ann Arbor and at about the time I have in mind. But to appreciate the layout, you would have to see the 1:15 P. M. American Express, the train that did not stop at Ann Arbor, round the curve east of the station, sweep past and disappear under the bridge of the Ann Arbor R. R., its wooden coach on the rear, bobbing up and down, trying hard to keep up with the rest of the train and not be left anywhere on the road.

100th Anniversary of Opening of the First Steam Railroad In Massachusetts

FROM BOSTON TO NEWTON. 1834-1934

By WARREN JACOBS



TEN o'clock on the morning of April 16, 1834, one hundred years ago, occurred one of the most important events in the history of Boston, for at that hour, the first regular steam train ever operated in the State of Massachusetts, pulled out of the Boston & Worcester Railroad depot, then located at the corner of Washington St. and Indiana Place (now Corning St.). No marker has been placed, as yet, to designate the historic spot where the first railroad station in Boston stood.

The following is the notice of the opening of the first steam railroad in operation in Massachusetts, taken from the old files of the Boston Courier in the Boston Public Library.

BOSTON AND WORCESTER RAIL ROAD

The Public are respectfully informed that the Boston and Worcester Rail Road is now open for the conveyance of passengers. The Cars will start from the Depot at 10 o'clock A. M. and 3½ P. M. daily for the present for Newton.

Returning the Cars will leave Newton at a quarter past 11 A. M. and a quarter before 5 P. M.

Tickets may be obtained or seats secured at the Company's office at the Depot No. 617 Washington Street.

Tickets for the return passage may be taken at the same place, or of the Master of the Cars at Newton.

Office Hours;—8 o'clock A. M. and until 1½ P. M. and 3 o'clock until 7 P. M.

By order of the President and Directors.

F. A. WILLIAMS, *Clerk.*

The annual report of the Company for 1834 says;—"The passages between Boston and Newton have been chiefly made with the "Meteor" engine which was built by Mr. Stephenson in England. It is a light engine, but of a fine model, well built and for its size of great power."

Benjamin T. Hill, in a paper read before the Worcester Society of Antiquity, in Salisbury Hall, Worcester, on Sept. 3, 1901, on the "Beginnings of the Boston & Worcester Railroad" said that William H. Hovey ran the first locomotive out of Boston in 1834.

The first passenger cars were built by Osgood Bradley of Worcester and were hauled to Boston by horses over the highway. They were of the stage coach type with flanged wheels.

There is no record of who the first passengers were, nor was there any silhouette-artist at hand when the first train pulled out of Boston, as was the case in the opening of the Mohawk & Hudson R. R. However we do know that Mrs. Daniel Denny, wife of one of the directors, rode on the engine a few days before the formal opening of the road, and was the first woman ever drawn by steam in Massachusetts.

The Boston Advertiser published the following account the week after the opening;—"The cars have run regularly forenoon and afternoon, since the opening, without any accident or disappointment of any sort. The passage of nine miles, has been made in one instance, with about 100 passengers in 21 minutes and without any over exertion of the engine, or any apparent danger. But the directors prefer that a slower rate of travelling shall be maintained, and have therefore instructed the engineer to make the passage in about 30 minutes or an average of 18 miles an hour. We consider it fully established by the experiences thus far on the road, that this speed may be maintained as the ordinary rate of travelling without hazard to the passengers, or any extraordinary wear of the engine and cars, and consequently that when the road shall be completed the passage between Boston and Worcester will be regularly made in less than two and a half hours. The number of passengers each way, in the afternoon trip, has usually exceeded a hundred. On Monday afternoon (April 21st) 168 passengers went out in eight cars, and an equal number returned, and the passage each way was made in half an hour. As soon as the season shall become more favorable for such excursions, two trips will be made on each afternoon and they will in two or three weeks be extended three or four miles farther".

Nathan Hale, the first President of the Boston and Worcester Railroad, and to whom much of the early success of the road was due, was born in Westhampton, Mass., in 1784 and graduated at Williams College in 1804. He was a tutor at Phillips-Exeter Academy for two years and removed to Boston and was admitted to the bar in 1810. In March 1814 he purchased the Boston Advertiser, the first daily in New England. An early advocate of railroads, he was President of the Boston and Worcester from the organization of the Company July 25, 1831 until June 4, 1849. He was the nephew and namesake of Captain Nathan Hale of the Revolution and father of the Rev. Edward Everett Hale and was the close and intimate friend of Daniel Webster for many years.

Such in brief was the opening of the first steam railroad in Massachusetts, which in course of time became part of the present Boston & Albany Railroad.

Worth Reading

Compiled by ELIZABETH O. CULLEN, *Reference Librarian*
Bureau of Railway Economics, Washington, D. C.

BOOKS AND PAMPHLETS

The American Railroad in Laboratory. 554 p. Illus. Washington, Chicago, New York, American Railway Association. 50 cents. With introduction and a chapter on history of American railroads by Edward Hungerford, this book goes on to discuss briefly specific accomplishments growing out of research and experiments by railroads individually or collectively thru the American Railway Association, in solving varied problems in mechanical, engineering, signal, telegraph and telephone, operating, safety, medical, protective, transportation, purchases and stores, automatic train control, reduction of freight claims, and Freight Container Bureau fields.

An Economic Survey of Motor Vehicle Transportation in the United States, by Bureau of Railway Economics. 219 p. Washington, Bureau of Railway Economics (Special Series Bulletin no. 60). *Gratis*. Factual survey of highway development, financing highway construction and maintenance, city streets, taxation of motor vehicles and of railroads, the problem of railroad grade crossings, and regulation of motor vehicles, with a brief review of motor transport development in foreign countries.

A History of Agriculture in the State of New York, by Ulysses Prentiss Hendrick. 462 p. Illus. Albany, N. Y., Printed for the New York Agricultural Society. \$3. Chapter 8—Turnpikes, Chapter 11—Waterways, and Chapter 12—Railways outline the effects on rural life in New York of the several improvements in transportation.

A Hundred Years of Inland Transport 1830-1933, by C. E. R. Sherrington. 326 p. London, England, Duckworth. 15 shillings. "This book is designated not as a text-book of transport principles but rather as a chronicle of achievement showing the effect of transportation on the social organization of Great Britain . . ." (*Introduction*)

A Review of Railway Operations in 1933, by Julius H. Parmelee. 32 p. Washington, Bureau of Railway Economics. *Gratis*. Reprinted by permission from *Railway Age*, Jan. 27, 1934, with figures revised to March 1, 1934, as Special Series Bulletin no. 62.

The Story of a Southern Carrier—The Louisville and Nashville, by John Leeds Kerr. 67 p. New York City, Young & Ottley, Inc. \$1. Brief history.

They Had Their Hour, by Marquis James. 324 p. Indianapolis, Ind. The Bobbs-Merrill Co. \$2.75. Railroaders including the crews of the "General" and the "Yonah" locomotives in the Civil War, the train crews and others who had their parts in seeing that Abraham Lincoln got safely from Springfield, Ill. to Washington, D. C. to be inaugurated President of the United States, and the construction crews and engineering staffs of the Union Pacific and Central Pacific railroads completing the "first transcontinental railroad" in 1869.

Tomorrow's Transportation, by T. J. Maloney. 5 p. Illus. New York City, Institute of Aero-Dynamic Research. *Gratis*. Speed and operating requirements of the present, and the relation of stream-lining of motive-power, equipment, and motor vehicles, to the solution of problems.

Trains, by Robert S. Henry. 110 p. Illus. Indianapolis, The Bobbs-Merrill Co. \$2.50. Starting the "Tom Thumb" and the "Best Friend of Charleston" this book proceeds to outline changes in design of locomotives and equipment through a hundred years. End-paper maps by Aline Gray Wharton show "A Century of Railroads in America", while an appendix "Freight Car Initials", and the pictures of locomotives of the future as well as those of the past, invariably fascinate each person who sees them.

PERIODICAL ARTICLES

Airplanes on Tracks—A Comment on the Beginning Vogue for Streamlining Railroad Trains, Following the Airplane's Example, by Alexis de Sakhnoffsky. Illustrated in color. *Esquire*, April 1934, p. 44-45.

The Burlington Train, by O. E. Ward. Illustrated with "an Artist's idea of how the new train will look." *Journal of the Western Society of Engineers*, December 1933, p. 352-355.

Die Eisenbahnen der Erde im Jahr 1931, by Auerswald. Lengths in kilometers of railroads in various countries in the world, with a table, p. 2-3, summarizing kilometers by continents, 1927-1931. *Archiv für Eisenbahnwesen* 1934: 1-12; Jan.-Feb.

High Speed Rail Transport, by A. Cotsworth. "Floor plan of the new 3-car articulated train for the Burlington Route" p. 351. *Journal of the Western Society of Engineers*, December 1933, p. 349-351.

"*Indian Rails*"—*With a Big Dividend of Pleasure! "Model" Railway Working in India*, by R. Horsefield. Illustrated description of a model railway constructed and operated in a garden in India. It has stations, a turntable, and an inspection car besides a coal-burning locomotive and passenger cars in which the author-owner takes guests and casual callers riding. Mr. Horsefield extends a hearty invitation to anyone visiting India to come up and ride on this garden-railway. *India State Railways Magazine*, February 1934, p. 179-189.

Locomotive Number 60000 Goes to The Franklin Institute. When the Franklin Institute moved to its new home on the Parkway in Philadelphia it had room for the experimental, 3-cylinder compound, 4-10-2 type locomotive that has been used experimentally on the lines of the Pennsylvania, Baltimore & Ohio, Burlington, Santa Fe, Southern Pacific and Great Northern railways. Illustrated. *Baldwin Locomotives*, January 1934, p. 24-25.

New Haven Cars Embody New Principles in Design. Fifty coaches that will be streamlined and fitted with facilities for every comfort in traveling, to be delivered later this year. Illustrated. *Railway Age*, April 7, 1934, p. 516.

Union Pacific Train Sets New Standard in Weight, Design and Speed. Illustrated. *Pullman News*, January 1934, front-cover, p. 67-69, 80-81.

New Books

Under this caption we wish to call the attention of our members to two new volumes recently printed, both of which are well worth owning.

Trains, by Robert S. Henry, 110 pages, illustrated. Published by the Bobbs-Merrill Co., Indianapolis, Indiana. In this book Mr. Henry has told the reader briefly but concisely the story of the development of the American railroads. This book was the outcome of some talks given by the author at the Darlington School for Boys, Rome, Georgia. Mr. Henry traces the crude beginnings of the locomotive up to the modern stream lined train of today. He paints an interesting picture of the roads as they were built westward. He describes the operation of everyday railroading in such simple language that the average layman can understand what it is all about and if this is not enough, the 144 illustrations, which are exceedingly well chosen, tell the story almost without the text. Whether you wish this book for reference or whether you wish a clear story of the achievements of the American railroads, here is a book, with no reference to the financial side, which must appeal to you. Lastly, Mr. Robert S. Henry is a railroad man—he is the Assistant to the Vice President of the Nashville, Chattanooga & St. Louis Railway. The price of this book is \$2.50 and if your book dealer has not a copy, you can procure same by writing to Chas. E. Fisher, 6 Orkney Road, Brookline, Mass.

Richard Trevithick, by H. W. Dickinson and Arthur Titley, 290 pages, illustrated. Published by The University Press, Cambridge and The Macmillan Co., 60 Fifth Ave., New York, N. Y. This book was written to commemorate the centenary of the death of Richard Trevithick, Civil Engineer and a pioneer in the use of high steam pressure. To many of us, the name Richard Trevithick is associated with the experimental locomotive—"Catch me who can", which was built as the result of a wager and tried in London. The authors have made an exhaustive study of the life of Richard Trevithick and one cannot but be impressed with their painstaking labors over this versatile genius. His early associations with mining operations and engines, the steadfast friendship of Davies Giddy, his first steam road carriage at Camborne, his work in connection with steam dredgers, the building of the tunnel under the Thames River, his visit to South America are all carefully detailed and outlined in a most interesting manner. The authors have given us a valuable biography of Richard Trevithick. The price of this book is \$5.00 and copies can be procured from the Macmillan Company, 60 Fifth Ave., New York, N. Y.